NATURA SOMOGYIENSIS 15.

Válogatott tanulmányok IV.

ISSN 2560-1040

Miscellanea IV.

ISSN 2061-3067

Kaposvár, 2009

A megjelent kötetek pdf-ben is elérhetők:
http://www.smmi.hu/termtud/ns/ns.htm

Published volumes are available online in pdf format:
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A technikai szerkesztő munkatársai - *The technical editor's assistants*
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HU ISSN 20613067
ISSN 2062-9990 (Online)
ISSN 1587-1908(Print)
ISBN 978-963-7212-69-7

Kiadja - *Published by:*
Somogy Megyei Múzeumok Igazgatósága - *Directorate of Somogy County Museums*
Felelős kiadó - *Responsible publisher*:
Dr. Költő László megyei múzeumigazgató - *director*
Nyomdai munkák - *Printed by*:
Pethő & Társa Nyomdaipari Kft. Kaposvár

Tartalom - *Contents*

DOI:10.24394/NatSom.2009.15.5

Előszó
a Natura Somogyiensis 15. jubileumi kötetéhez
a múzeum fennállásának 100. évfordulóján

Somogy megye természeti értékeinek feltárása, kutatottsága két élesen elkülönülő részre tagolódik. A megye északi határán elterülő Balaton - amely hazánk legnagyobb természeti kincse - tavi kialakulását, fejlődését, növény-, és állatvilágát már a múlt század első felében is átfogó módon vizsgálták. Az elmúlt években ugyancsak intenzíven kutatott területté vált – nemzeti parki státuszának (1996) köszönhetően – a Dráva-völgye is. A megye más területeit: a Zselicet, Külső-Somogyot, Belső-Somogyot és a Marcalihátat részben, vagy egyáltalán nem vizsgálták.

A „Natura Somogyiensis" című sorozat célzatosan, folyamatosan tünteti el az említett hiányokat. A kézben tartott kötetben is több tanulmány érinti ezeket a kevésbé kutatott területeket, amellett, hogy a természettudományi gyűjtemény nemzetközi kitekintésben is jelentős gyűjteményének feldolgozására is törekszik. A sokrétű tanulmány-válogatás rávilágít a megye élővilágának erős balkáni kötődésére is.

Somogy természeti, természetvédelmi értékeinek feltárásához a Somogy Megyei Múzeumok Igazgatóságának munkatársai és az általuk szervezett kutatási programok a távolabbi és a közelebbi múltban egyaránt jelentős mértékben járultak hozzá.

A Somogy Megyei Múzeumhoz kötődő természettudományi kutatásoknak, a gyűjtemények kialakulásának három jellegzetes periódusát tudjuk megkülönböztetni:

A múzeumban a II. világháborúig gyűjtött természettudományi anyagot a háború során elpusztították, széthordták.

A természettudományi muzeológia szempontjából az 1950-es évek hoztak nagy változást, ugyanis ezekben az években (1953-tól 1958-ig) Dr. Marián Miklós gimnáziumi tanár muzeológusként vizsgálta a megye flóráját és gerinces állatvilágát. Rendkívül jelentős gyűjtőmunkát folytatott, országos viszonylatban is komoly kétéltű- és hüllő gyűjteményt hozott létre. Somogyi eredményeiről negyvenkét publikációban adott hírt. Kutatásait két időszaki kiállításon mutatták be, és a múzeum akkori állandó kiállításának egyik legszínesebb része volt a Baláta-tó általa gyűjtött élőlényein keresztül bemutatott élővilága. Első publikációi között szerepelt a fehér gólya tudományos megfigyelése, leírása. Jelen kötetben az általa lefektetett alapokon nyugvó, azóta folyamatosan folytatott megfigyelés eredményeiről is kapunk tájékoztatást.

A harmadik korszak kezdetét 1980-ra tehetjük, amikor a Somogy megyei múzeumi hálózatban ismét muzeológus-kutató kezdte meg munkáját, és a természettudományi gyűjtemény anyagát tekintve olyan méretű, és minőségű fejlődésen ment át, hogy erre alapozva 1985-ben már természettudományi osztály alakult. Azóta intenzív gyűjteménygyarapítással kialakult egy olyan természettudományi alapgyűjtemény, amely nemcsak Somogyból, Magyarországról, hanem a környező (sőt távolabbi) országokból is őriz jelentős gyűjteményi anyagot.

Elsőként a Somogyi Múzeumok Közleményei sorozat 1992-es kötete reprezentálta azokat a kutatásokat, amelyek a megyében a közelmúltban folytak. Ez után hamarosan (2001-től) egy újabb, kifejezetten természettudományi tanulmánykötet-sorozatot köszönthettünk „Natura Somogyiensis" néven, amely rendszeresen közli a megyében folyó, de nem csak a megye területét érintő, természettudományos kutatások kiemelkedő eredményeit, és a Somogy Megyei Múzeum természettudományi gyűjteményében őrzött anyagok tudományos feldolgozását.

2009-ben a múzeum fennállásának 100. évfordulója alkalmából örömmel adhatunk hírt arról, hogy ennek a sorozatnak immár a 15. kötetét adhatjuk az olvasók kezébe.

Reméljük, hogy a természeti értékeink, környezetünk védelme és jobb megismerése érdekében a jövőben töretlenül folytatódhat az a tudományos munka, amelyet a múzeum szakalkalmazottai külső kutatómunkatársak segítségével végeznek és adnak közre a Natura Somogyiensis hasábjain.

Kaposvár, 2009. november 12.

Dr. Költő László
megyei múzeumigazgató

DOI:10.24394/NatSom.2009.15.7 | Natura Somogyiensis | 15 | 7-14 | Kaposvár, 2009

A new forest fringes forb association: *Deschampsio caespitosae–Inuletum helenii* in SW-Hungary

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DÁVID, J.: *A new forest fringes forb association: Deschampsio caespitosae–Inuletum helenii in SW-Hungary.*
Abstract: A new fringes forb association is described from the South Transdanubian Zselic Hills in SW Hungary. It develops at the lower parts of the slopes and bottoms in the wet valleys along the creekside alder-forests, characterized by the dominance of *Inula helenium* and species of reed vegetation and wet meadows.

Keywords: Zselic Hills, new forb association, SW-Hungary

Introduction

A new plant association was detected in the valleys of Forest of Vitorág, the southern part of the Zselic Hills, SW-Hungary. The hilly region is situated between the valley of Kapos river and the broad alluvial lowland of river Drava. The mainmass of the hilly region is built up of sediments of the Pannonian Sea during the Pliocene and covered by loess in the Pleistocene (BORHIDI 1984, MAROSI, SOMOGYI 1990). This loess cover has partly eroded during the Holocene, while on the remained loess ridges envolved steep slopes and narrow valleys evolved. The highest peaks are Ropoly (278 m) in the western and Hollófészek (357 m) in the eastern part of the Hills. On the broad central ridges zonal beechwoods (*Vicio oroboidi-Fagetum*) and hornbeam-oak woods with silverlime (*Helleboro dumetorum-Carpinetum*) (BORHIDI 1984, JUHÁSZ 2008) are prevailing. The southwards directed valleys – surrounded by steep (30-40°) slopes like the Vitorág valley – where the holotype stand of the association developed black meadow soils cover the lower part of slopes and the bottom of the valley at a height of 165 m and approximately horizontal situation. The ecotop of the stand is regularly flooded in spring time for shorter period. In the middle of summer the groundwater table is in 30–70 cm depth. The showy plant community was discovered and recognized in 1998, and its name and a short characterization published by the author in 2003 (in BORHIDI 2003:350.). The validating, the name and description of the association according to the syntaxonomic rules are published here, as follows.

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

Table 1: The aggregated table of the association *Deschampsio caespitosae-Inuletum helenii*

Fajnév	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	K	ÉFO	FLE	COENOS	COENOB	TVK	SBT	TB	WB	RB	NB	LB	KB	SB
Deschampsia caespitosa	65	75	50	70	35	40	30	55	60	25	V	H	KOZ	0!	5.4.1.6.	K	C	6	7	6	3	7	5	0
Inula helenium	1	15	20	5	35	30	0	15	25	30	V	H	ADV	E411	8.4.3.3.	V	S	7	7	6	5	6	6	0
Juncus effusus	0.5	1	0	1	1	0.1	0.1	2	1	0.1	V	H	KOZ	I	INDIFF	TZ	DT	5	9	6	3	8	3	0
Lycopus europaeus	0.1	0.1	1	2	2	1	0.1	1	1.5	0.1	V	HH	EUA	H	INDIFF	K	DT	6	9	6	7	7	5	0
Lysimachia nummularia	0.1	0.1	1	1	1	1	0.1	1	0.1	0.1	V	CH	EUR	I	INDIFF	K	DT	6	7	8	4	5	4	0
Mentha pulegium	0	0.1	0.1	0.1	0.1	1	0.1	1	0.1	2	V	H	SME	I	INDIFF	TZ	DT	7	7	8	4	8	3	1
Filipendula ulmaria	0.1	0	0	0.1	0	1	0.1	1	0.1	0.1	IV	H	EUR	I	5.4.1.,	K	G	4	8	6	4	7	3	0
Ajuga reptans	0.2	0	0.1	1	0.1	1	0.5	0.1	1	0	IV	H-CH	EUR	B	INDIFF	TZ	DT	5	6	6	5	6	2	0
Brachypodium sylvaticum	0.1	0	0.1	0	1	1	0	1	0.5	0.1	IV	H	EUA	E	INDIFF	K	G	5	5	6	5	5	5	0
Equisetum telmateia	0.1	0	1	0.1	0.1	0	1	0.1	0	0.1	IV	G	CIR	E411	8.4.3.3	E	C	6	8	6	5	5	2	0
Fragaria vesca	0.1	0	0.1	1	0.1	0.1	0.1	0	1	0.1	IV	H	CIR	C	8.4	K	G	5	5	6	6	7	5	0
Lythrum salicaria	0	0.1	0	0.1	0.1	0.5	0.1	0.1	1	0.1	IV	H-HH	KOZ	I	1.5.	K	G	5	9	7	4	7	5	1
Polygonum hydropiper	0.1	0	2	1	1	0.5	1	0	0.1	1	IV	TH	CIR	H	3.2.1.	TZ	NP	5	9	7	5	7	4	0
Prunella vulgaris	0	0.1	0	0.1	0.1	0.1	0.1	0.1	1	0	IV	H	KOZ	I	INDIFF	TZ	DT	5	6	6	4	7	3	0
Ranunculus acris	0.1	0	0.1	0.2	0.1	0.1	1	1	0	0.1	IV	H	EUA	H	5.4.	TZ	G	5	7	6	3	7	3	0
Rubus hirtus	0	0.1	0.1	0.1	0.1	0.5	0.1	0	0	0.1	IV	H-N	CEU	C	8.6.1.2.	K	DT	6	5	6	6	7	4	0
Salvia glutinosa	0	1	2	0.1	0.5	0	1	0.1	0	0.1	IV	H	EUR	E41	8.4.3.	K	G	5	6	7	7	4	4	0
Trifolium repens	0	0.1	1	0.1	1	0.5	1	0	0.1	0.1	IV	H	KOZ	4	INDIFF	TZ	DT	5	5	6	7	8	3	1
Veronica chamaedrys	0	0.1	0.1	1	0.1	0.1	0.1	0.1	0	0.1	IV	H-Ch	EUA	C	INDIFF	TZ	DT	5	5	7	5	6	3	0
Achillea millefolium	0	0	0.1	0.1	0.1	0	0	0.1	1	0	III	H	KOZ	5	5.4	TZ	DT	5	6	5	5	8	5	1
Angelica sylvestris	0	0	0.1	0.1	0	0.1	0	0.1	0.1	0	III	H	EUA	H	INDIFF	K	G	6	8	6	6	7	5	0

Table 1 continued: The aggregated table of the association *Deschampsio caespitosae-Inuletum helenii*

Fajnév	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	K	ÉFO	FLE	COENOS	COENOB	TVK	SBT	TB	WB	RB	NB	LB	KB	SB
Anthriscus sylvestris	0	0	0.1	0.1	0	0.5	0.1	0	0.1	1	III	H	EUA	H	INDIFF	TZ	DT	6	5	7	8	7	5	0
Astragalus glycyphyllos	0.1	0	0	0.1	1	0	0.1	0.1	0.1	0	III	H	EUA	E	8.4	K	G	6	5	7	4	6	4	0
Bidens tripartitus	0	0	0.1	0.1	0	0.1	0.1	0.1	0	0	III	TH	EUA	I	3.2	TZ	W	5	8	6	8	8	5	0
Carex tomentosa	0	0.1	0	0.1	0	1	0	1	0.1	0.1	III	G	EUA	5	INDIFF	K	G	5	6	8	5	6	5	0
Cirsium oleraceum	0	0	0.1	0.1	0	1	0.1	0.1	0	0	III	H	EUA	5365	5.4.1.	K	G	5	7	8	5	6	3	0
Dipsacus laciniatus	0.1	0	0	0.1	0.1	0.1	0.1	0	0	0.1	III	TH	POM	A8	3.7	GY	W	6	7	8	5	9	3	0
Eupatorium cannabinum	0	0.1	0.1	0	0.1	0.1	0.1	0	0.1	0	III	H	EUA	I	INDIFF	TZ	DT	5	7	7	8	7	3	0
Odontites vulgaris	0.1	0.1	0	0.1	0	0.1	0	0.1	0.1	0	III	Th	EUA	I	INDIFF	TZ	DT	6	5	7	6	6	3	1
Phleum pratense	0	0	0	0.1	0.5	1	0.1	0	0	0.1	III	H	CIR	5	5.4	TZ	G	5	5	6	6	7	5	0
Physalis alkekengi	0.1	0	0	1	0	0.1	0	0.1	0.1	0	III	H	SME	E411	8.4.3.3	K	G	7	7	7	8	5	5	0
Solidago gigantea	0	0.1	1	2	1	0	0.1	0	0	0.1	III	H	ADV	A512	3.5.	K	AC	6	8	6	8	7	5	0
Tanacetum vulgare	0	0	0	1	0.1	2	1	0.1	0	0	III	H	EUA	A	3.5.2.1	K	W	5	5	6	5	8	4	0
Verbascum nigrum	0.1	0	0	0.1	0	0	0	0	0.1	0	III	TH-H	EUA	E6	6.2.	TZ	DT	5	4	7	7	7	5	0
Alopecurus pratensis	0	0.1	0	0.1	0	0	0	0.1	0	0	II	H	EUA	H	5.4	E	C	5	6	6	7	7	5	1
Ambrosia artemisifolia	0.1	0.1	0	0	0	0	0	0	0.1	0	II	TH	ADV	A	INDIFF	GY	AC	8	5	7	7	9	6	0
Calystegia sepium	0.1	0	0	0	0	0.1	0	0.1	0.1	0	II	H	KOZ	H	3.5.2.	K	DT	6	9	7	8	8	5	0
Colchicum autumnale	0	0.1	0	0	0.1	0	0	0	0	0.1	II	G	SME	5	5.4	K	G	5	6	7	4	6	2	0
Holcus lanatus	0	0.1	0	0	0.1	0	0.1	0	0	0.1	II	H(Ch)	EUR	5	5.4	K	G	5	6	6	4	7	3	0
Humulus lupulus	0	0	0	0	0.1	0	1	0.1	0.1	0	II	H	CIR	E113	INDIFF	TZ	DT	6	7	6	8	7	3	0
Knautia drymeia	0.1	0	0	0	0	0.1	0	0.1	0	0	II	H	CEA	E4	8.4.3.	K	G	6	6	6	5	5	6	0
Koeleria cristata	0	0	0	0.1	0.1	0	0	0	0.1	0	II	H	KOZ	9	5.3	K	G	6	3	8	2	8	6	0
Lathyrus pratensis	0.1	0	0.1	0	0	0	0.1	0	0	0.1	II	H	EUA	5	5.4	TZ	DT	5	7	7	6	7	4	0
Myosoton aquaticum	0	0	0.1	0.1	0	0	0.1	0	0	0.1	II	TH-TH	EUA			GY	DT	5	8	6	7	7	3	0
Urtica dioica	0	0	0.1	0.1	0	0	0	0.1	0	0	II	H	KOZ	I	INDIFF	TZ	DT	6	7	6	9	6	4	0
Allium scorodoprasum	0	0	0	0.1	0	0	0	0	0	0	I	G	CEU	I	INDIFF	TZ	DT	6	5	7	7	6	6	0

Material and method

Ten relevés were made in several valleys of the Zselic Hills between 23 September 1998 and 12 July 1999 both from the spring and the late summer aspects with classical phytosociological methods according to the Zürich-Montpelleir school, using sampling plots of 10 × 10 m = 100 m^2 size. and the A–D-values processed and evaluated with MS Exel 2007 program. The composition of the community was analyzed life-form and distribution type of the species and for their relative ecological indexes according to Ellenberg and Borhidi (ELLENBERG et al 1991, BORHIDI 1993) and for their social behaviour types according to BORHIDI (1993). The relevé no. 6 is selected for holotype of the association (table 1).

Characterization of the association

The association appears along the fringes of the oak-hornbeam forests where the alluvial oak-ash-elm forests (*Knautio drymeiae-Ulmetum*) or the creek-side alder forests have been cut and after the deforestation wet meadows developed under the human use for hay-meadow and grazing. The dominance of the medicinal plant *Inula helenium* a naturalized archeophyton originates from the important role playing in the wet forests of the region, as a characteristic species of the oak-ash-elm forests (BORHIDI 1984). Its prevailing going on after the cutting and grazing of the site untouched by the animals because of its poisonous property.

Physiognomy and structure

The community consists of two layers. The highest layer is formed by the dominant *Inula helenium* of 1.5–2 m height with a cover of 65–90%, followed by other tall forbs as *Filipendula ulmaria, Eupatorium cannabium, Equisetum telmateia, Angelica sylvestris, Urtica dioica, Solidago gigantea*, or with scattered individuals of *Carex pendula* and *Phragmites communis*. The lower layer is formed by medium sized plants and small forbs. In this usually very dense layer with cover up to 90–100% *Deschampsia caespitosa* is the dominant species followed by dense populations of *Aegopodium podagraria, Salvia glutinosa, Lythrum salicaria, Lysimachia nummularia, Mentha pulegium, Lycopus europaeus, Myosoton aquaticum, Trifolium repens*.

Constant species

Deschampsia caespitosa, Inula helenium, Juncus effusus, Lycopus europaeus, Lysimachia nummularia and Mentha pulegium.

Sub constant species

Ajuga reptans, Brachypodium sylvaticum, Equisetum telmateia, Filipendula ulmaria, Fragaria vesca, Lythrum salicaria, Polygonum hydropiper, Prunella vulgaris, Ranunculus acris, Rubus hirtus, Salvia glutinosa, Trifolium repens, Veronica chamaedrys.

Distribution of life-form

The ruling life-form type is the hemikryptophyta (Fig. 1). Concerning the number of species the hemitherophytes are the second but concerning the group-mass percentage, they do not reach the 10%.

Flora element distribution

According to the number the Eurasian and the cosmopolitan species prevail, beside them (10% participation) the circumpolar and the adventives species appear (Fig. 2). If

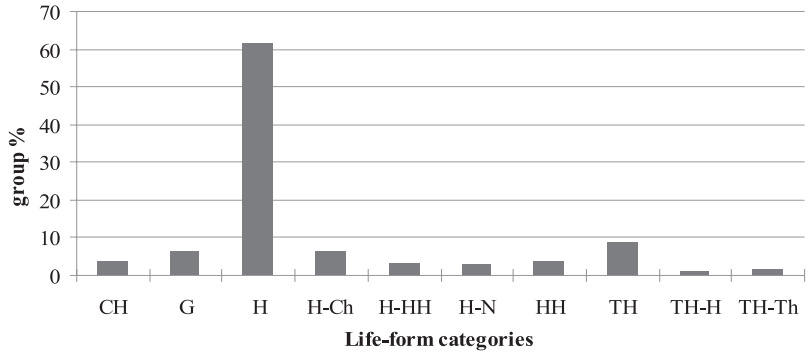

Fig. 1: The distribution of the lifestyle categories according to a group share

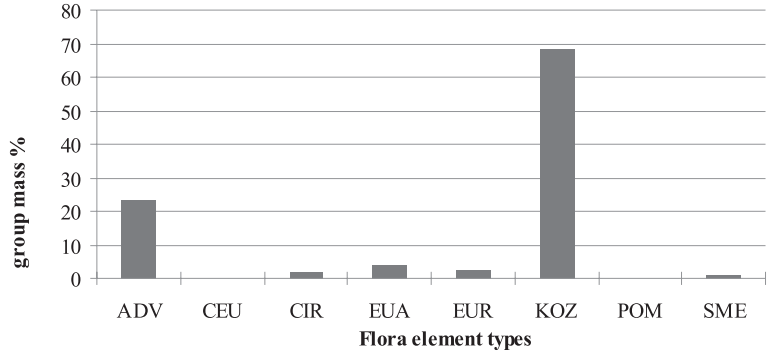

Fig. 2: The distribution of the flora element types according to group mass

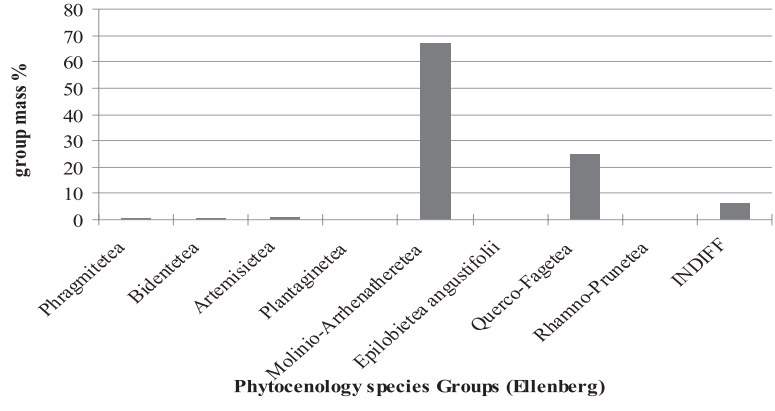

Fig. 3: The phytocenology species groups' distribution according to a mass percentage

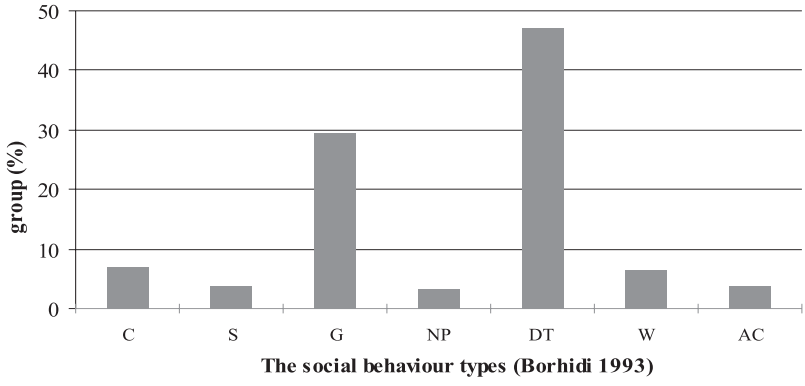

Fig 4: The distribution of social behavior types (by BORHIDI) according to a group share

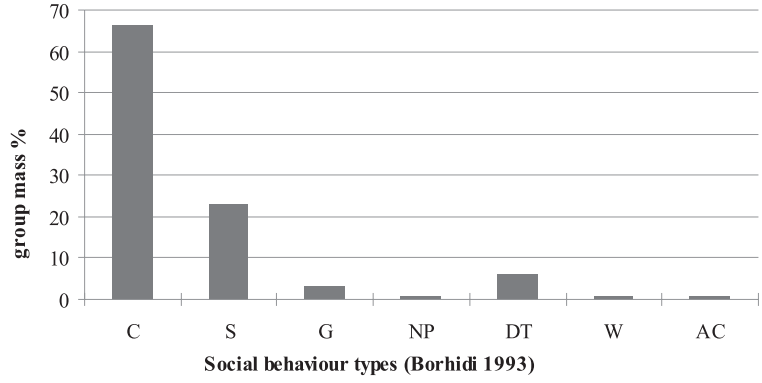

Fig. 5: The social behavior types according to group mass

we examine the group mass rate cosmopolitans' participation is 70% taking into consideration that the presence of adventives is also remarkable due to the dominant Inula helenium. The aggressive neophyte plants may effect as a possible danger to the association namely the low rate presence of *Ambrosia artemisiifolia* and the *Solidago gigantea* may increase significantly.

Phytosociological groups

Regarding their mass the *Molinio-Arrhenatheretea* class allocates the characteristic features of the association (Fig. 3). Beside them the resettling elements of the forests (*Querco-Fagetea*) from the edge appears.

Naturalness state

Among the social behaviour types the disturbance tolerant species (47%) and the generalist (29%) species dominate because of the half natural human activity (Fig. 4) which did not introduce many new species. Therefore ruderal species do not play an important

role, the natural competitors represent the good state of the association with 70% presence (Fig. 5). Beside them the special species show the value of the association with their 23% presence.

Summary

The newly characterized plant associations in South-Transdanubia can be found in Landscape protection area of Zselic. In this loess area in the South orientated narrow (20-25 m) valleys on black meadow-soils developed a forest-fringes association formed by tall and low forbs. There is no permanent water flow and even after heavy rain there is no water flow at its sites. Ten relevés were made in several valleys of the Zselic Hills between 23 September 1998 and 12 July 1999 both from the spring- and the late summer aspects with classical phytosociological methods according to the Zürich-Montpelleir school, using sampling plots of 10 × 10 m = 100 m^2 size, the 6th is taken as holotype. The name of the association is *Deschampsio caespitosae Inuletum helenii* Dávid. Their dominant species in the tall layer of 1.5–2 m height is *Inula helenium*, in the low layer: *Deschampsia caespitosa*. Further constant species of the association are: *Juncus effusus, Lycopus europaeus, Lysimachia nummularia* and *Mentha pulegium*. Basically the cosmopolitan plants dominate (70%) but unfortunately adventive neophytes, e.g. *Ambrosia artemisiifolia* and *Solidago gigantea* may endanger the stability of the composition. The wet and hay-meadow species (*Molinio-Arrhenatheretea*) characterize the community. The high participation of natural competitors (70%) shows a good state of the association.

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DOI:10.24394/NatSom.2009.15.15 | Natura Somogyiensis | **15** | 15-26 | Kaposvár, 2009

From Külső-Somogy to Mecsek Hills: Vegetation of three hilly landscape regions of SW Hungary

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Ortmann-né Ajkai, A. & Horváth, F.: *From Külső-Somogy to Mecsek Hills: Vegetation of three hilly landscape regions of SW Hungary.*

Abstract: Landscape-level GIS analysis of actual vegetation of Baranyai-hegyhát, Völgység and Tolnai-hegyhát was performed on the base of Landscape Ecological Vegetation Database and Map of Hungary (MÉTA). Natural and semi-natural vegetation covers 34% in Baranyai-hegyhát, closest to Mecsek hills, and about 10% in the other regions. 45 habitat types occur, 53% of all Hungarian ones. Patterns of mesophilous and dry and semi-dry grasslands and forests, according to climatic data, shows a distinct SW-NE gradient from mesophilous beech and hornbeam-oak forests to turkey oak-pedunculate oak and closed steppe oak forests and from colline hay meadows to xero-mesophilous grasslands and closed steppes. Our results support Hungary's new vegetation-based landscape regions.

Keywords: landscape-level vegetation patterns, actual natural and semi-natural vegetation, continentality gradient, grid-based analysis, habitat database (MÉTA)

Introduction

Tolna-Baranya hills (Tolnai-hegyhát, Völgység and Baranyai-hegyhát regions) are situated south of Külső-Somogy, north of Mecsek Hills. The three regions are adjacent to each other in a southwest-northeast sequence. Völgység, in the middle, is transitionary between the two other ones. Regarding its geomorphology and land-use (stronger anthropogenic effect) it resembles to Tolnai-hegyhát, but regarding e.g. its climate it stands closer to Baranyai-hegyhát. This is why it is interesting to present analyse these three regions in the same paper. As a consequence of their similar character and their gradual transition, their classification is uncertain: according to vegetation-based landscape regions of Hungary (Molnár et al. 2008) Völgység and Baranyai-hegyhát are grouped together with Mecsek hills, only Tolnai-hegyhát preserved its autonomy.

Research results are sparse from each of the three regions. Some sporadic floristic results, mostly by-products of study of neighbouring regions (Mecsek, Mezőföld) are published in Kevey (1989, 1993, 1995, 2001, 2004), Kevey & Horváth (2000), Tóth (1998, 2000, 2002), Király (1998). MÉTA Survey, a country-wide research project collecting habitat data according to a strict protocol for building Landscape Ecological

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

Fig. 1: Overview map of study area (MAROSI, SOMOGYI 1990)

Vegetation Database and Map of Hungary (MÉTA) brought many new data on the vegetation of these regions (MOLNÁR et al. 2007). MÉTA Survey was performed on about half of the total area of these regions by the first author. This paper presents detailed vegetation description based on MÉTA database. A short description was published by TÓTH and CSIKY in KIRÁLY (2008a,b,c).

Research area

The three adjacent regions, situated in Tolna and Baranya countries, south of Külső-Somogy, are transitionary towards Mecsek Hills and Duna valley (Fig. 1.). This hilly landscape is bordered by easily recognizeable structure lines: Völgységi- and Mucsi-Hidasi creeks in the south, Sásdi-árok in the west, Kapos river in west-northwest, Duna valley in the east. Its average height is 180-300 m a.s.l. Area of Baranyai-hegyhát is 200 km^2, of Völgység is 450 km^2 and of Tolnai-hegyhát is 600 km^2 (MAROSI and SOMOGYI 1990).

Climate of Völgység and Baranyai-hegyhát is moderately warm and moderately wet; of north part of Tolnai-hegyhát is moderately warm, moderately dry. More climate factors show a distinct SW-NE gradient of increasing continentality in Baranyai-hegyhát – Völgység-Tolnai-hegyhát sequence (Fig. 2).

Most widespread soil type of Baranyai-hegyhát is brown forest soils with clay illuviation (88%), of Völgység are brown forest soils with clay illuviation (47%) and chernozjem brown forest soils (29%), of Tolnai-hegyhát are chernozjem soils (53%) but also Raman brown forest soils cover a significant area (21%) (MAROSI and SOMOGYI 1990).

According to phytogeographical classification, all three regions belong to Sopianicum included in Praeillyricum; their vegetation is similar to that of Mecsek hills, but less rich, especially in mediterranean elements (KEVEY and HORVÁTH 1986).

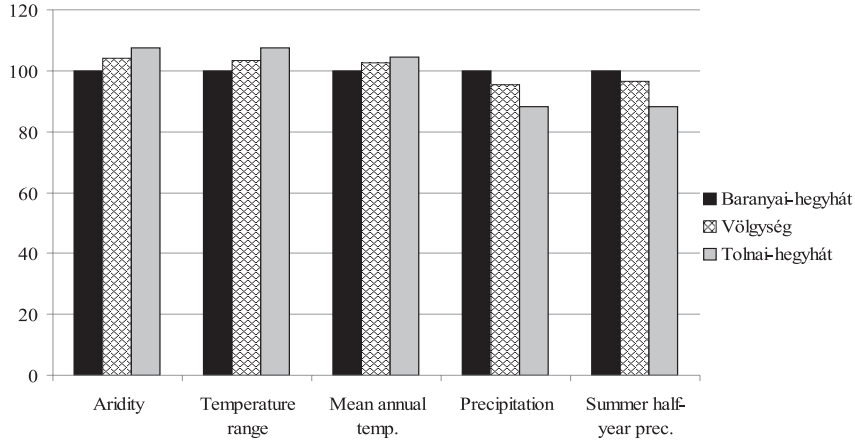

Fig. 2: Climatic gradients in the three regions studied (100%: Baranyai-hegyhát)

According to the potential natural vegetation map of Hungary (ZÓLYOMI 1989), Baranyai-hegyhát is situated marginally between zones of illyrian hornbeam-oak forests and turkey oak – sessile oak forests, Völgység is in the zone of turkey oak – sessile oak forests, and Tolnai-hegyhát is in zones of turkey oak – sessile oak forests and closed and mixed steppe oak forests. Original vegetation types – besides of these zonal communities – are: azonal alder woodlands, lowland oak-hornbeam woodlands (very rare), and small stands of euhydrophyte vegetation and marshes along watercourses, acidic oak-hornbeam and beech forests on steep, hillsides with soils turning slightly acidic, some small rock and ravine woodlands (only in Baranyai-hegyhát, closest to Mecsek hills), and extrazonal beech forests. All three regions are intensively cultivated today, natural and semi-natural vegetation covers in Baranyai-hegyhát about 34%, in other two ones about 10%. Actual vegetation consists of remnants of former forests, secondary xero-mesophilous grasslands in place of former forests, pastures with trees (only in Baranyai-hegyhát), in valley bottoms mesotrophic and *Arrhenatherum* hay meadows, in place of former lowland alder groves secondary willow stands, and narrow, fragmented euhydrophyte and marsh belts of fishponds' edges.

Data collection and analysis

Field data collection was executed between 2003-2006 as a grid-based, satellite-image supported (SPOT4), multi-attributed, large-scale mapping method called MÉTA (MOLNÁR et al. 2007). It was directed and coordinated by compulsory use of Á-NÉR 2003 mapping and habitat guides (MOLNÁR 2003, BÖLÖNI et al. 2003). The goals were: 1) collecting data of all natural and semi-natural habitat types in Hungary 2) creating maps of natural and semi-natural vegetation patches and 3) evaluating landscapes with vegetation types and their attributes as well. The database is constructed on a hexagon grid system of 35 hectars covering the whole area of Hungary as mapping units. Approximately 100 hexagons are grouped into a quadrant at landscape scale. In hexa-

gons habitat types, roughly estimated areas and vegetation attributes are listed (e.g. naturalness, neighbourhood, land use). This database is suitable to determine natural-based habitat quality and to compose the prognosis of future changes for vegetation and landscape (SALAMON-ALBERT and HORVÁTH 2008a,b). Our study area consists of 31 whole MÉTA quadrants and of 23 quadrant-parts.

Analyses and maps are based on vegetation type and area data of MÉTA database. Occurrences and area data of each habitat type were summarized for quadrants, and some types were contracted (see detailed analyses). Data query was performed with MS SQL, GIS analysis were executed and maps prepared with ArcGIS 3.1 (HORVÁTH and POLGÁR 2008).

Habitat groups occurring in the study area are as follows, bold ones are representing habitats covering larger areas. Habitat nomenclature and codes are by BÖLÖNI et al. (2003, 2007).

A. Euhydrophyte habitats:
A1 - Standing water communities with Trapa, Lemna, Salvinia and Ceratophyllum,

B. Marshes:
B1a - Eu- and mesotrophic reed and Typha beds,
B2 - Glyceria, Sparganium and Schoenoplectus beds,
B3 - Water-fringing helophyte beds with Butomus, Eleocharis and Alisma,
B4 - Tussock sedge communities,
B5 - Non-tussock beds of large sedges,
B6 - Salt marshes,
BA - Mosaic/Zonation of marsh communities of channels, ditches and artificial lakes
D. Rich fens, eu- and mesotrophic meadows and tall herb communities:
D34 - Mesotrophic meadows,
D5 - Water-fringing and fen tall herb communities,
D6 - Tall herb communities of floodplans and marshes

E. Colline and montane hay meadows, acid grasslands and heaths:
E1 - Arrhenatherum hay meadows,
E2 - Festuca rubra hay meadows and related communities,

H. Dry and semi-dry closed grasslands:
H3a - Slope steppes on stony ground,
H4 - Bromus erectus-Brachypodium pinnatum xero-mesophilous grasslands, dry tall herb communities and forest steppe meadows,
H5a - Closed steppes on loess, clay, tufa,
H5b - Closed sand steppes

I. Non-ruderal pioneer habitats:
I2 - Semi-desert vegetation on loess cliffs,
O. Other non-woody habitats:
OA - Uncharacterisic wetlands,
OB - Uncharacteristic meadows and tall herb communities,
OC - Uncharacteristic dry/semi-dry grasslands and tall herb communities,

Bush vegetation and woodland margins:
J1a - Salix cinerea mires,
P2a - Mesic shrub vegetation,
P2b - Dry shrub vegetation with Crataegus, Prunus spinosa and Juniperus,
M6 - Continental deciduous steppe thickets,
M8 - Thermophilous woodland fringes

Riverine and swamp woodlands:
J2 - Alder and ash swamp woodlands,
J5 - Riverine ash-alder woodlands,
J6 - Riverine oak-elm-ash woodlands

K. Mesic deciduous woodlands:
K1a - Lowland oak-hornbeam woodlands
K2 - Oak-hornbeam woodlands,
K5 - Beech woodlands,
K7b - Acid oak-hornbeam woodlands

L. Dry deciduous woodlands:
L1 - Closed termophilous oak woodlands,
L2a - Turkey oak - sessile oak woodlands,
L2a - Turkey oak - se4ssile oak woodlands,
L2x - Closed and mixed steppe oak woodlands on foothills,
L5 - Closed lowland steppe oak woodlands,

LY Rock woodlands:
LY1 - Ravine woodlands (mesic rock woodlands rich in Acer pseudoplatanus),
LY2 - Mixed forests of scree, rocky slopes, rich in Tilia spp.,
LY3 - Limestone beech woodlands,
LY4 - Mixed relic oak woodlands on rocks

Other woody habitats:
RA - Scattered native trees or narrow tree lines,
RB - Uncharacteristic (often pioneer) softwood woodlands and plantation,
RC - Uncharacteristic hardwood woodlands and plantation,
RD - Uncharacteristic woodlands and plantation mixed with non-native tree species,
P45 - Wooded pastures and sweet chestnut woodlands,
P7 - Extensive orchards with ancient cultivars (often invaded by shrubs and trees)

Results

Overwiew of natural and semi-natural habitats

Natural and semi-natural habitats (all MÉTA types except RD – Uncharacteristic woodlands and plantations mixed with non-native tree species) are preserved best in Baranyai-hegyhát (34% of total area), in Völgység and Tolnai-hegyhát far less (11.7% and 12%, accordingly). Much of natural and semi-natural vegetation in Baranyai-hegyhát and (74%, 58%) or almost half of it (Tolnai-hegyhát: 46%) is made up of forests, located in three blocks: in the whole area of Baranyai-hegyhát (adjoining to forests of Mecsek hills), and two isolated remnants of woodlands on hills SE from Kapos valley: one of them is on the border between Völgység and Tolnai-hegyhát, the other one is on the northern part of Tolnai-hegyhát. On deforested areas near-natural vegetation consists of small patches of grasslands and wetland habitats mostly along streams, and uncharacteristic tree stands (Fig. 3.)

45 habitat types occur in study area, 53% of all Hungarian vegetation types. Most of types can be found in Tolnai-hegyhát (38 types, 45%), some less in Baranyai-hegyhát and Völgység (34 types, 40%, 32 types, 38%). Woody habitat types are most diverse in Baranyai-hegyhát (12 types, 48% of woody types), which has less continental climate and lies closest to forest-covered Mecsek hills. Regarding only mesophilous forest (K group), their representation is 80%, only acidophilous beech forests are missing. Grassland habitat types are most diverse in Tolnai-hegyhát, close to the forest-steppe zone (25 types, 45% of all grassland types). Woody habitat types are also more numerous (10/40%) here than in Völgység, laying closer to woodland-rich Baranyai-hegyhát, because of dry forest types (L group). Grassland habitats are far less diverse in Baranyai-hegyhát and Völgység (18 types, 32%) (Fig. 4).

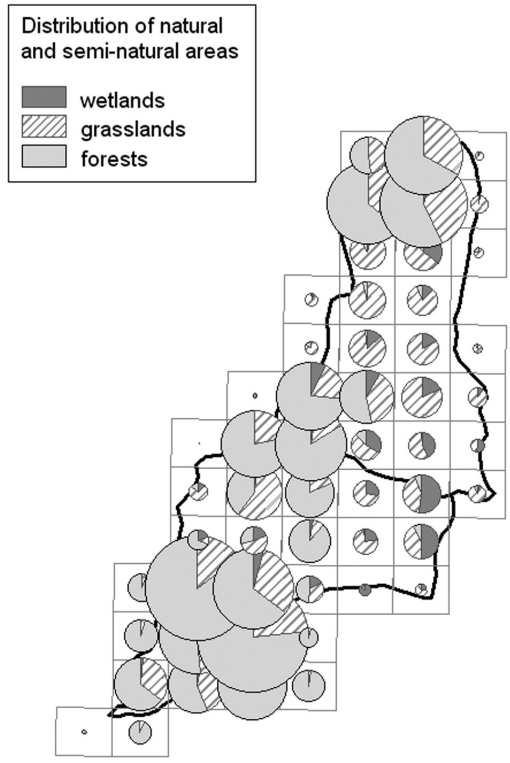

Fig. 3: Distribution of natural and semi-natural areas

Regarding cover data too, most of natural and semi-natural areas are mesophilous forest (K group, 8000 ha), more precisely oak-hornbeam forests (K2). More than half of these forests are in Baranyai-hegyhát. Area of well-lighted dry oak forest is about 3000 ha, most of them are turkey oak – sessile oak forests (2300 ha) and closed mixed steppe oak woodlands on foothills (L2x, 700 ha); 70% of them are in Tolnai-hegyhát. Next habitat types with significant area are uncharacteristic grasslands (OB, OC – 2000 ha) and bushes (P2a, P2b – 2300 ha) showing that degradation of grassy habitats by overgrowing with scrubs, due to abandonment of grazing, is similar to countrywide negative trends. Other habitat types with with an area worth mentioning are dry and semi-dry closed grasslands (1600 ha) and reedbeds and sedge habitats (near 1000 ha) (Fig. 5.)

Detailed description of habitats

Wetland habitats

Wetland habitats (A, B groups) cover less than 1% of total area, 5% of natural and semi-natural vegetation. Euhydrophyte habitats (A group) are especially poor, represented only by A1 type (standing water communities), due to the fact that natural lakes are missing here, and intensive fishponds and canals are not appropiate for them. Marshes (B group) are more widespread (625 ha) and diverse (6 of 7 MÉTA types), but most of them are narrow, fragmented reed or *Typha* stands at the edges of canals and

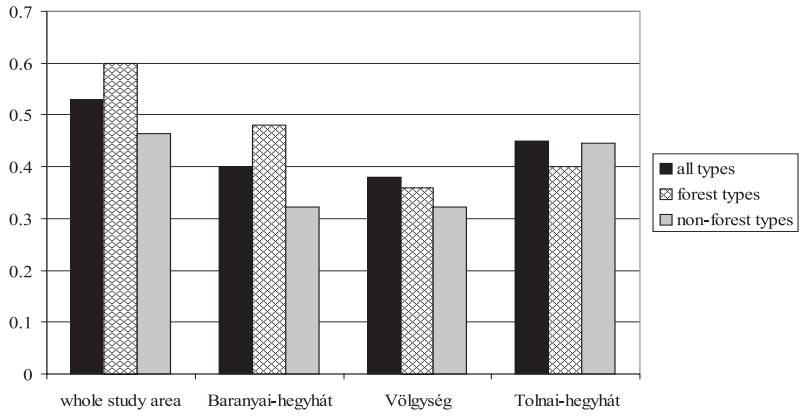

Fig. 4: Habitat types occurring in the regions (% of all MÉTA types)

fishponds. Non-tussock large sedge beds (B5) are most widespread natural and semi-natural habitats of valley bottoms, covering 245 hectares, mostly in Völgység (170 ha). (Fig. 3.)

Grassland habitats

Grassland habitats are basically divided into two groups: dry and semi-dry grasslands of hillsides (H group) and wet and mesotrophic ones (D, E). Distribution of these two groups fits to the SW-NE climatic gradient. Wet and mesotrophic meadows are more widespread in the hornbeam-oak vegetational zone, and their relative cover is also higher in deforested areas, due to hay meadows of valley bottoms, where tillage is constrained by frequent water coverage in springs – often they represent last remnants of near-natural vegetation here. Pastures with trees (P45), found only in Baranyai-hegyhát, in abandoned state, are shown separately due to their outstanding landscape and historical values (Fig. 6).

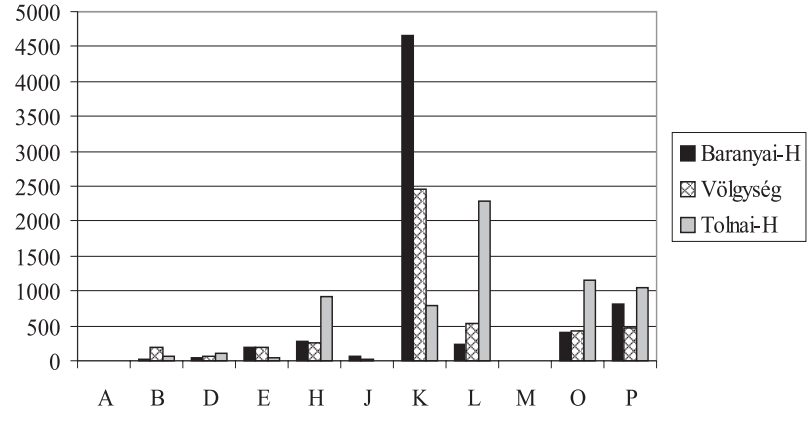

Fig. 5: Area of habitat groups in the three regions (ha)

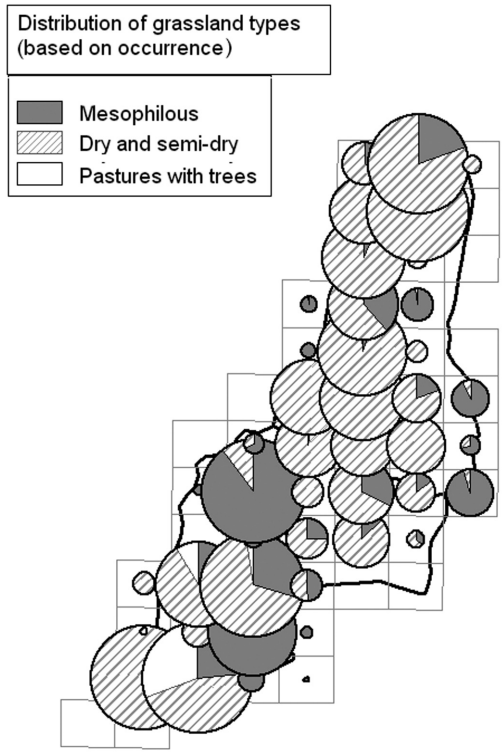

Fig. 6: Distribution of grasslands

Grassland habitats mentioned above covers 2300 ha, about half so much as uncharacteristic and bushy grasslands together. Natural and semi-natural grassland cover 11% of natural and semi-natural habitats, 1.9% of total area, most in Tolnai-hegyhát: 15% vs 2.4%. Area of grasslands increases with increasing continentality.

Most of natural and semi-natural grassland are dry or semi-dry ones (Group H, 1500 ha), occurring in all (whole) quadrants, on hillsides too steep for profitable cultivation, often secondarily on places of former vineyards. Two widespread types: closed steppes on loess and clay (H5a) and *Bromus erectus – Brachypodium pinnatum* xero-mesophilous grasslands, dry tall herb communities and forest steppe meadows (H4) are present in all three regions, Closed sand steppes (H5b) occur only in Tolnai-hegyhát.

Areal distribution of two widespread dry grassland types also corresponds well with the SW-NE climatic gradient: area of *Bromus erectus – Brachypodium pinnatum* xero-mesophilous grasslands, dry tall herb communities and forest steppe meadows (H4), replacing former forests after cutting decreases, area of closed steppes on loess and clay (H5a) increases with increasing continentality. H4 type (also herbaceous layer of wooden pastures) characterises Baranyai-hegyhát, with more forests and more atlantic climate; grasslands of Tolnai-hegyhát belongs almost completely to H5a; the latter one dominates also in the middle-situated Völgység, but not exclusively.

Mesotrophic and hay meadows cover far less area and their distribution is more rhapsodic. From group D mesotrophic meadows (D34) and tall herb communities (D5, D6)

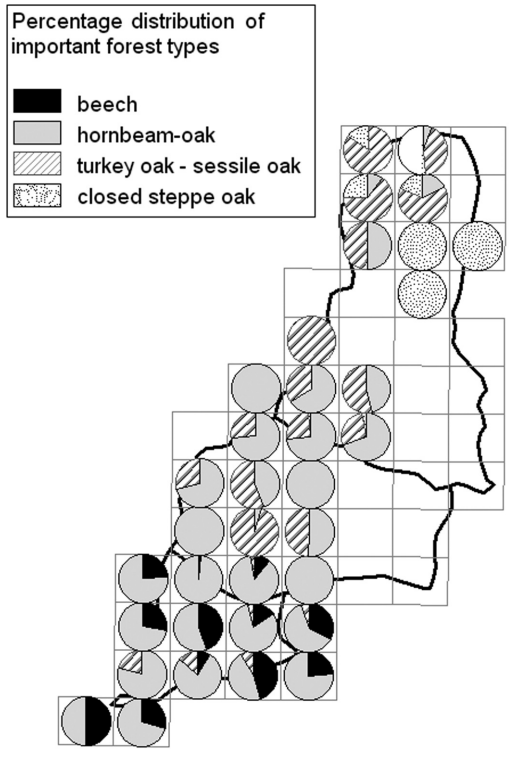

Fig. 7: Distribution of mesophilous and dry forests

are present. Total area of them is about 200 ha, they are situated mostly in valley bottoms, latter ones besides watercourses. None of group D grasslands types show any SW-NE gradient, perhaps due to their azonal, waterside character.

Hay meadows are represented by *Arrhenatherum* hay meadows (E1) in all regions, and *Festuca rubra* and related hay meadows (E2) with small area only in Baranyai-hegyhát. Their total area is 420 ha, 2.2% of natural and semi-natural vegetation.

Grasslands in this area are secondary, formed and maintained by century-long grazing and mowing. Their subsistence in natural and semi-natural state requires this traditional land use. In the past two decades significant decrease of extensive farming resulted in degradation or disappearence of natural and semi-natural grasslands, which indicated here by the fact that uncharacteristic grasslands (O group: mostly extremely weedy grasslands, in lesser extent artifical grasslands and regenerating old-fields) and bushes (P2, mostly overgrowing abandoned pastures, in lesser extent abandoned cultivated areas) covers twice as much as natural and semi-natural ones (2000+2300 ha vs 2300 ha).

Forest habitats

Much of natural and semi-natural vegetation in Baranyai-hegyhát and Völgység (74%, 58%) or almost half of it in Tolnai-hegyhát (46%) is made up of forests.

Natural and semi-natural forests (forest types without plantations) cover about 11000

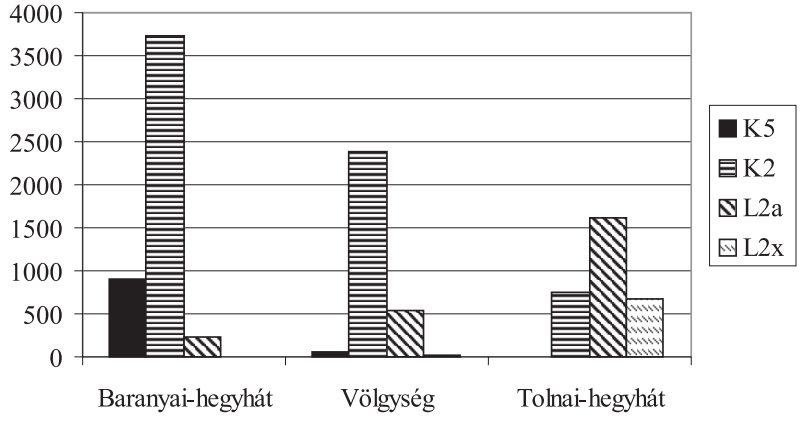

Fig. 8: Area of most important forest types

ha in the study area, almost half of them in Baranyai-hegyhát (5000 ha), neighbouring well-forested Mecsek hills. Percentage of forests of total region area of the region is 22.5% in Baranyai-hegyhát, far less, 7.5% (3000 ha) and 6% (3100 ha) in Völgység and Tolnai-hegyhát, accordingly. Native tree plantations (RB, RC) covers less than 1% of total region area everywhere, but in many deforested parts in Völgység and Tolnai-hegyhát only these are the only woody ("forest-like" in landscape view) communities.

Natural and semi-natural woody habitats are diverse in habitat level, 15 of 25 MÉTA types occur here (60%). Percentage areas of forest habitats demonstrate that our study area intersects three vegetational zones. Most of forests are hornbeam-oak forests (K2, 62% of total forest area), turkey oak – sessile oak forests (L2a, 21%) and closed and mixed steppe oak woodlands (L2x, 6%). Extrazonal beech forests cover 9%. Other forest types occurs only accidentally (2%).

Areal distribution of forests shows (Fig. 3.) that Baranyai-hegyhát is well forested (22.5%), but forests are basically missing from the other two regions except for two larger forest blocks: isolated remnants of woodlands on hills SE from Kapos valley. On of them is on the border between Völgység and Tolnai-hegyhát, laying between settlements Döbrököz, Dúzs, Mucsi and Mekényes (predominantly mesophilous forests (group K), similar to that of Mecsek hills); other one is on the northern part of Tolnai-hegyhát, with more dry forest (group L), between settlements Belecska, Simontornya, Kisszékely, Nagyszékely and Miszla.

Wet and mesophilous woody habitats of valley bottoms are: alder and ash swamp woodlands (J2), riverine ash-alder woodlands (J5), riverine oak-ash-elm woodlands (J6), lowland oak-hornbeam woodlands (K1a), scattered native trees (mostly williows) and narrow tree lines (RA). They are present everywhere but with small area: total of 250 ha, 1.3% of natural and semi-natural habitats. Their significance is that in many deforested areas only they represent natural and semi-natural woody habitats. Alder groves (J5), original vegetation besides streams, quickly disappear as we leave forested Baranyai-hegyhát in NE direction; in the two deforested regions they are replaced by groups and borderlines (RA) of willows (mostly *Salix alba*).

Mesophilous forests (group K) are present in every region, but their area and diversity decreases with increasing continentality towards NE. In Baranyai-hegyhát four of five mesophilous forest habitats are present: lowland oak-hornbeam woodlands (K1a),

dominant oak-hornbeam woodlands (K2, 3700 ha), beech woodlands (K5) and acid oak-hornbeam woodlands (K7b); only acid beech woodlands (K7a) are missing. Dominant mesic woodlands in Völgység are also hornbeam-oak forests (2400 ha), and we can find some beech forests (K5, 60 ha) on northern slopes of the above-mentioned large forest block. Of mesic woodlands only hornbeam-oak forests occur in Tolnai-hegyhát with a total area of 750 ha, but it is far less then coverage of dry woodlands (3000 ha).

Complementarily to mesic woodlands, area of dry woodlands increases with increasing continentality. According to climatic gradients, area percentages of dry woodlands (especially that of turkey oak – sessile oak woodlands (L2a) and of closed and mixed steppe oak woodlands (L2x)) increasing from SW to NE (Fig. 7). Closed and mixed steppe oak woodlands even become dominant in some quadrants of Tolnai-hegyhát. Völgység and Tolnai-hegyhát are separated most distinctly by this attribute. Explosive area increase of closed and mixed steppe oak woodlands (L2x) is especially remarkable. (Fig. 8).

Our analyses support Zólyomi's "map of natural vegetation" so far that Tolnai-hegyhát belongs to vegetational zones of turkey oak – sessile oak woodlands and closed and mixed steppe oak woodlands, but does not support that Baranyai-hegyhát lays in zones of turkey oak – sessile oak woodlands and illyrian hornbeam-oak forests, and Völgység wholly in turkey oak – sessile oak zone. According to our data, Baranyai-dombság lays clearly in hornbeam-oak zone, and Völgység in hornbeam-oak and turkey – sessile oak zones, so the border between hornbeam-oak and closed and mixed steppe oak woodlands zones seems to be situated more to the east compared to Zólyomi's map.

Our results support Hungary's new vegetation-based landscape regions (Molnár et al. 2008) as long as Baranyai-hegyhát belongs to Mecsek, and Völgység – showing a transitory character beetween the two others in most of our analyses – can be grouped here too because of absence of closed and mixed steppe oak woodlands. Its being a separate region is neither supported by our results.

Acknowledgements

MÉTA Project was financed by the grant of OM-NKFP/2002: "Magyarország természetes növényzeti örökségének felmérése és összehasonlító elemzése". Further botanists performing field data collection in these regions are: R. Bányai, J. Csiky, J. Dávid, Á. Fridrich, P. Lőrincz, G. Mányoki, T. Morschhauser, K. Rudolf, T. Kovács, G. Osztermayer, Cs. Tóth, A. Varga, J. Zsidákovits.

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DOI:10.24394/NatSom.2009.15.27 | Natura Somogyiensis | 15 | 27-40 | Kaposvár, 2009

Long-term monitoring of *Himantoglossum adriaticum* H. Baumann population in Keszthely Hills, Hungary

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Bódis, J. & Molnár, E.: *Long-term monitoring of Himantoglossum adriaticum H. Baumann population in Keszthely Hills, Hungary.*

Abstract: Long-term monitoring of populations contributes to the better understanding of population dynamics of species. A population of the orchid *Himantoglossum adriaticum* H. Baumann was monitored in Keszthely Hills in western Hungary during the period 1992-2008. To assess reproductive output in each year, the number of flowering individuals, as well as the number of flowers and fruits produced per plant were recorded. The reproductive traits studied (except the number of flowering plants and seedpods) did not varied considerably, they showed low temporal variability over years, while the other two characteristics mentioned had high temporal variability. Mean number of flowers produced per plant over all years was 31. Fruit-production was often low or zero. Significant correlations between the rate of fecundity and any of the flowering traits could not be found. Years with high fruit-production do not coincide with years of great number of inflorescences. Thus, the number of inflorescences measured in any one year can not be used as a substitute for reproductive performance measurements. Years with high fruit-set may be able to insure long-term survival of the population.

Keywords: orchid, *Himantoglossum adriaticum,* flowering, fruit-set production

Introduction

In general "the term 'monitoring' has been used to describe many types of activities", and it can be defined as "the process of gathering information about some system" (Yoccoz et al. 2001). The monitoring is an essential tool for science, conservation and management, even if it has been last for long periods. In this case the long-term responses of species and ecosystems to different disturbances (e.g. climate change, experimental manipulations) can also be evaluated (Lindenmayer and Likens 2009). The goal of species monitoring is to detect the temporal changes in population size (e.g. stable, declining, or increasing over time) and find out trend in population dynamics (Kull et al. 2008). In Hungary the monitoring of protected and endangered species has been carried out in the framework of the Hungarian Biodiversity Monitoring System since 1998 organized by the Hungarian National Parks and controlled by government. The species studied, *Himantoglossum adriaticum* is included in the list of species to be monitored.

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

The changes of orchid population size have been studied for a long time in Europe (e.g. the historical records of *Himantoglossum hircinum* in British Isles have been dated back almost 300 years, GOOD 1936). Their rarity and conspicuous inflorescence might contribute notably to this fact. Recently (ca. in the last 60-70 years) the investigations have already been tended not only to detect the occurrences and to estimate rough abundances (many, frequent, few etc.) but also to study detailed the temporal and spatial variability of population size, demographic traits, flowering frequency, life-cycle, etc. in order to get new knowledge of orchids which facilitate the more effective conservation and management (WILLEMS J. H. and MELSER 1998, WOTAVOVÁ et al. 2004). In cases of orchids different kinds of methods were applied for observations. There are more complicated, time-consuming procedures when permanent quadrats, individual marks have been used, and in such a way the population sizes of orchids can be estimated more exactly. Another, more simple and easily practicable method is to follow the population dynamics counting the flowering individuals in a given site. KULL (2002) summarized the researches of the European north temperate orchids collecting data from 67 species studied at least for three years. In 40% of cited references only flowering individuals were studied. The lengths of the monitoring periods of different orchid species are varied from some years to more than ten years in Europe. The advantage of the long-term investigations is that a more reliable picture can get on the dynamics of populations depending from the environment (including for example the transitions of stages, survival possibility etc.). Among the numerous studies it is remarkable Tamm and his colleagues'observations (TAMM 1972, INGHE and TAMM 1988) who followed the survival and flowering frequency of four orchid species in permanent quadrats nearly for five decades in Sweden. Long-term demographic studies of two orchid species (*Orchis morio* and *Herminium monorchis*) concentrated mainly on the flowering behaviour affected by the climatic factors influencing the flowering processes (WELLS et al. 1998). The demographic traits of *Orchis simia* were analysed over 18 years to find out the long-term survival strategy of an isolated orchid population by WILLEMS and BIK (1991). The variation in population size of *Orchis morio* were assessed by the dynamics of flowering spikes over a 26 year period using unfertilized plots in a fertilizer experiment in Britain (GILMANN and DODD 1998).

In spite of many investigations, there is no general explanation for the yearly change of the flowering intensity. In the case of many orchid populations there have been successful explorations of the environmental effects which influenced the number of flowering individuals, the fruit-set formation (e.g. weather conditions: WELLS 1981, INGHE and TAMM 1988, WELLS and COX 1989, WILLEMS and BIK 1991, CAREY 1999, PFEIFER et al. 2006a,b; herbivores: WELLS and COX 1991, KINDLMANN 1999, KINDLMANN and BALOUNOVÁ 1999).

Among the recent *Himantoglossum* species *H. hircinum* is the best known. It was mentioned several times from many countries over centuries ((e.g. in the British Isles since 1641) (GOOD 1936). In Germany there is a valley (Leutra valley near Jena, Thuringia) where the flowering and vegetative individuals of *H. hircinum* have been monitored since 1878. The exact number of plants found between 1976 and 2001 was 13,687 (HEINRICH 2000, PFEIFER et al. 2006a). *H. hircinum* has large distribution area, and almost every European speciemens was considered as *H. hircinum* until 1978, when Baumann described *H. adriaticum* from the Istrian Peninsula (BAUMANN 1978). The distribution area of the *H. adriaticum* is much smaller, than that of *H. hircinum*, but it is not limited to the region of the Adriatic Sea as the name would suggest. It also appears in Italy, Slovenia, Croatia, Austria, Hungary, in Slovakia up to Moravia and in Bohemia (near Ketkovice) (RYBKA et al. 2005, VUKOVIČ and NIKOLIČ 2006).

The *H. adriaticum* populations are not too frequent in Hungary. The present Hungarian populations show spatial and temporal variability in sizes. The abundances small in the majority of sites, varied from 2-3 individuals to 60-70 ones, but there are populations with more hundred speciemens (data originated from the reports of the Hungarian Biodiversity Monitoring System).

In this paper we concentrate on the following questions:

- do the reproductive traits studied vary over time, what extent is the temporal variability?
- does a so called 'good orchid year' mean a reproductive success also, that is, in the years when there are a lot of flowering individuals, do they grow higher and develop more flowers and seedpods than in the years when there are only a few flowering individuals (a so called 'bad orchid year')?

Material and methods

The species studied

Himantoglossum adriaticum is a perennial herb with two underground tubers. *H. adriaticum* has no strong goat odour as *H. hircinum*, and there are narrower leaves in the rosette, the inflorescence is looser and has fewer flowers, the helmet is smaller and closed, the spur is shorter, the colour of the flower is reddish-brown and the labellum is less twisted, but the cut is deep (BAUMANN 1978). The morphometrical values of aboveground parts, both reproductive and vegetative organs of the species was described by BAUMANN and KÜNKELE (1982), DÉNES et al. 1993, MOLNÁR V. (1999), BÓDIS and ALMÁDI (1998). The leaves of *H. adriaticum*, similarly to other species distributed in Mediterranean region, appear after the late August and/or early September rainfalls and have an intensive growth period until the frosts come. The plants assimilate during the winter, except if there is a snow cover. A new growth period follows in early spring, when the medium sized and the large individuals grow 2-3 new leaves. After this period the inflorescence, which had been initialized in the former vegetation year, begins to develop. The time of flowering is generally the middle of June, and it lasts for 2-3 weeks. It takes another 3 weeks until the seedpods will be ripened. The leaves of the rosette will have withered till the flowering time, but it can be delayed by wet weather (BÓDIS and BOTTA-DUKÁT 2008).

Study site

H. adriaticum was studied in Keszthely Hills, in western Hungary, at the boundary of the village Gyenesdiás and Keszthely town (Fig. 1). The orchid population was found by I. Szabó, on both sides of the Pilikán-Szoroshad minor road, in dolomite grassland, on the edge of the forest (SZABÓ 1987). In the study area calciphilous oak woodland, shrub woodland and pine plantation form a vegetation mosaic with dolomite grassland. Habitats are disturbed, the vegetation is degraded (owing to mainly human activities). *H. adriaticum* grows in the grassland near the road and on the edge of the expanding shrubs and trees.

Methods and data analysis

The flowering individuals were searched and counted along the 1 km long section of the road in every June, from 1992 to 2008. The number of inflorescences and the number of flowers per spike were counted, the heights of the spikes and the lengths of the inflo-

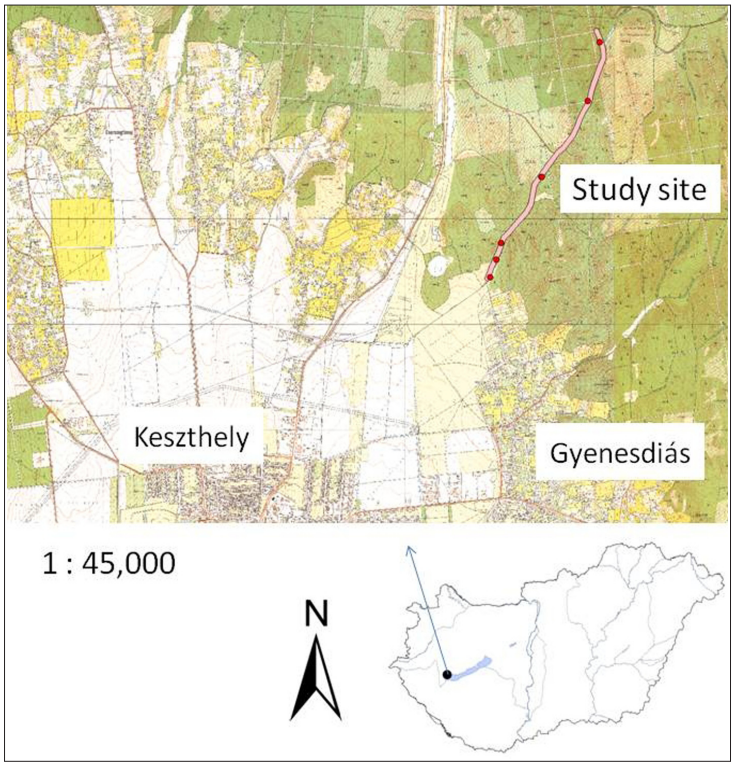

Fig. 1: The occurrences of *Himantoglossum adriaticum* population studied in Keszthelyi Hills, western Hungary

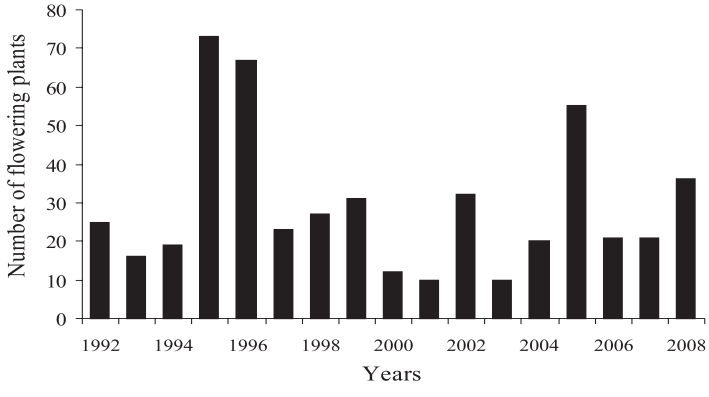

Fig. 2: The number of flowering plants in the study period (1992-2008)

rescences were measured. The latter ones were recorded only from 1998. The fruits were counted three weeks after the flowering time. The inflorescences which were not able to develop in consequence of the drought were not taken into consideration, because they could not be found only by chance. The damaged inflorescences and spikes without any flowers bitten off by caterpillar were also neglected.

The data of reproductive characteristics (height of flowering plant, number of flowers and fruits) were evaluated in the whole investigation period (17 years), but the lengths of inflorescences were measured over 11 years. The Q-Q plot and if this method gave ambiguous results Kolmogorov-Smirnov test were applied to test the normality of data. The majority of the reproductive characteristics studied (except the fruit number) show normal distribution. Duncan test was used for comparing reproductive traits to detect inter-annual fluctuations. In the case of the fruit number due to the lack of normality non-parametric tests (Mann-Whitney and Kruskal-Wallis H test) were used for the same purpose. Linear correlation was calculated to detect the relationship between reproductive characteristics. All statistical analysis were carried out using the software package SPSS 13.1.

Results

The number of flowering individuals varied considerably between years (between 10 and 73 individuals) (Fig. 2). Richest years in inflorescences were 1995, 1996 and 2005, while the poorest were 1993 and 1994 and the beginning of 2000's (2000, 2001, 2003), respectively.

The average height of flowering plants was 51.0 cm, while the lowest value was 18 cm, the highest was 97 cm (Fig. 3). There was a significant relationship between the number of flowering individuals and the average height of flowering individuals ($r= 0.654$, $p<0.05$, $df=16$).

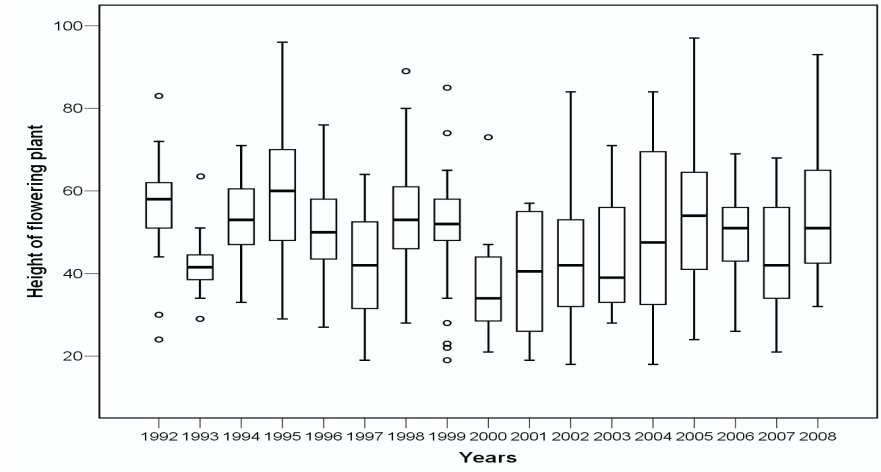

Fig. 3: The heights of flowering plants. The lower quartile, median and upper quartile are shown. (Outliers are that data wich lies more than 1.5 times the interquartile range lower than the first quartile or 1.5 times the interquartile range higher than the third quartile)

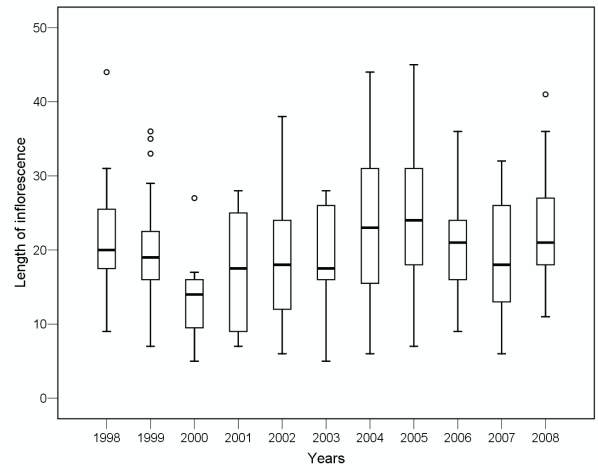

Fig. 4: The lengths of the inflorescences. The lower quartile, median and upper quartile are shown. (Outliers are that data wich lies more than 1.5 times the interquartile range lower than the first quartile or 1.5 times the interquartile range higher than the third quartile)

The flowers appear generally on the 20 cm top section of the spike. The average length of the inflorescences was 20.8 cm (minimum 5 and maximum 45 cm) (Fig. 4). A significant relationship with the number of flowering individuals ($r=0.661$, $p<0.05$, $df=10$) was detected.

The individuals develop 31.8 flowers on average (minimum 4 and maximum 84 flowers per spike) (Fig. 5). There is no significant relationship between the number of flowering plants and the average number of flowers per plant.

In many cases only a few or no fruit (seedpod) develops on the stems. The highest value was 33 seedpods per inflorescence. There were years when only 1-2 seedpods per individual were developed (e.g. 1994, 1997, 1999, 2000 and 2001) (Fig. 6A). The fecun-

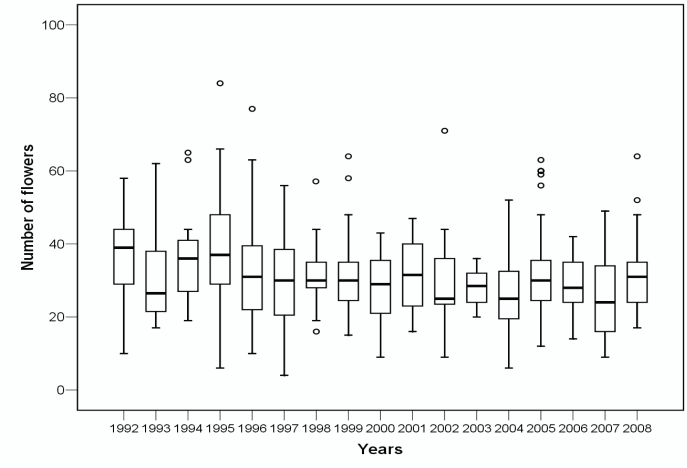

Fig. 5: The number of flowers. The lower quartile, median and upper quartile are shown. (Outliers are that data wich lies more than 1.5 times the interquartile range lower than the first quartile or 1.5 times the interquartile range higher than the third quartile)

dity (the number of seedpods produced) was extremely good in 2004, when 14 seedpods per plant were detected. The non-parametric tests prove the differences between the years (Kruskal-Wallis H test = 88.6, df=16, $p<0.001$). There was no relationship between the number of flowering individuals and the average number of fruits per plant.

The fecundity rate greatly varies over the years (Fig. 6B). The best year was 2004, when more than half part of the flowers got fertilised, while the number of flowering individuals was low. In other years, from much larger flower number much fewer seedpods developed. A good example is 2008, when there were twice as many flowers as in 2004, with only half the number of seedpods, so the fertility rate was only 11%. The worst years were 2000 and 2001, when the extremely dry spring damaged much of the inflorescence, so only few plants were able to bloom. The flowers withered very fast in the dry, unusually hot weather, so there was no time for pollination, the fertility rate was approximately 5%.

Comparising the coefficients of variation (CV%), among the reproductive traits studied, three ones (except the number of seedpods) have low variability over years (Table 1). In the case of the number of seedpods, however, the variability was of very large extent.

There was significant correlation between the height of flowering plants and the number of flowers regarding the whole investigation period (Table 2). The higher the

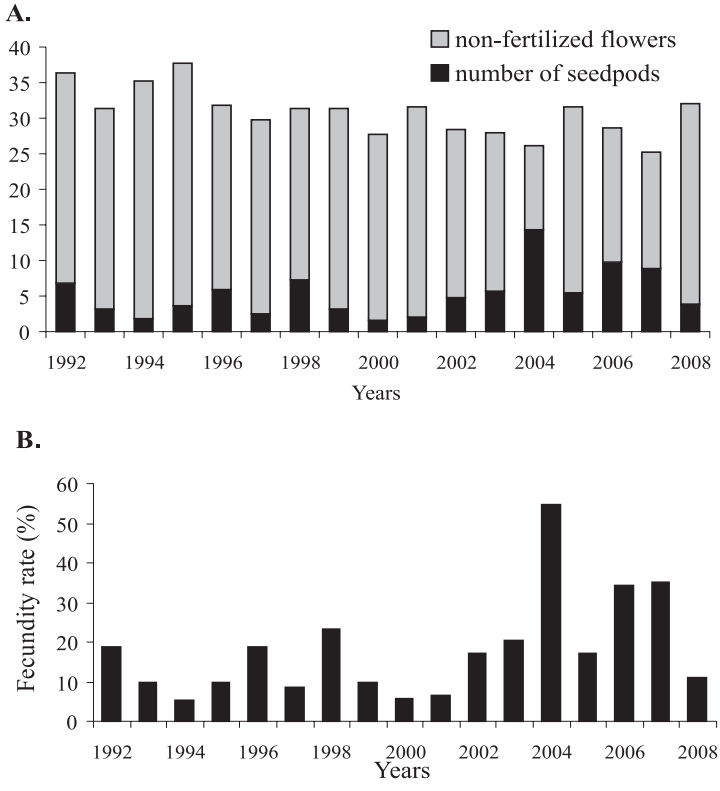

Fig. 6: The changes of reproductive traits of *Himantoglossum adriaticum* between 1992-2008. A. The number of sterile and fertile flowers per plant, B. The rate of fecundity

Table 1: The coefficient of variation (%) of the reproductive traits

Year	Height of flowering plant (cm)	Lenght of inflorescence (cm)	Number of flowers	Number of fruits
1992	22.4		36.1	99.2
1993	18.4		41.3	139.7
1994	20.1		36.9	151.2
1995	24.1		37.4	157.7
1996	21.6		40.2	105.0
1997	31.6		39.8	199.3
1998	22.6	33.6	26.1	81.7
1999	28.3	39.6	34.1	177.9
2000	37.9	41.2	34.8	175.5
2001	37.4	44.8	32.0	85.3
2002	38.6	44.0	41.4	134.6
2003	32.5	37.1	18.4	69.7
2004	41.0	43.3	41.7	59.9
2005	33.3	38.9	40.4	86.6
2006	23.9	29.9	27.5	100.2
2007	30.2	41.6	43.3	70.1
2008	27.0	31.0	35.4	112.1
pooled data	**30.0**	**39.9**	**38.5**	**119.9**

stem grows up the more flowers can develop on it. This relation is supported by the value of significant high correlation between the length of the inflorescences and the number of flowers. The stem height, in itself, does not influence the pollination; even if the stem is higher, the plant will not produce more seedpods. Although there is significant correlation between the number of flowers and the number of fruits (seedpods), but the value of correlation coefficient is very low referring to a slight relationship (Table 2).

Table 2: Relationships between reproductive traits (the correlation coefficients with asterisk are significant at $p<0.05$; the italic number refers to the mean value per individual; the length of inflorescence was measured from 1998 to 2008, others from 1992 to 2008)

	Length of inflorescences	Number of flowers	Number of capsules
Height of flowering plants	0.8903* *0.8629**	0.6738* *0.6715**	0.2614* *0.2222*
Length of inflorescences		0.7577* *0.3528*	0.4206 *0.3828*
Number of flowers			0.3974* *-0.4362*

Discussion

Number of flowering individuals

Counting flowering plants at a given site can be used to estimate trends in population performance. Although it does not show population size or flowering percentage.

During the 17-year monitoring period the number of flowering plants of *H. adriaticum* varied considerably between years (coefficient of variation 64.2). There were sevenfold difference in the number of flowering plants between the richest flowerful year and the poorest one. It was only three years when more than 50 individuals were able to flowering. From this point of view especially 1995 and 1996 proved to be very good years for *H. adriaticum* in the Keszthely Hills. The number of flowering *H. adriaticum* speciemens in this site is few comparing with that of *H. hircinum* in Germany or in England.

Other European orchid species have also great temporal fluctuations in the number of flowering plants. According to the results of long-term monitoring of *H. hircinum* population in the Leutra Valley (in Germany) carried out since 1960, the number of flowering plants reached almost 300 in 1974 and 1975, in other years it remained under 100 individuals. There began a long-lasting rise in 1988, which was disturbed by intensive fluctuations and with an extremely high value in 1995, when there were nearly 1400 inflorescences. Although in the next year were only a few inflorescences, there were 900-1000 flowering plants in 1997 and 1998 (HEINRICH 2000). The number of the flowering individuals changed very similarly to another population in Thuringia, where was also a large increase in 1995 (HEINRICH and VOELCKEL 1999).

The number of flowering individuals has been observed in the two largest populations of *H. hircinum* in England for a long time. Both populations had a small peak around 1950 and then had very low numbers until the 1980s. Later an intensive increase was observed in the abundance of flowering individuals, which resulted in 250 and 6000(!) inflorescences in the two sites (CAREY et al. 2002).

In the comparisons of spatial and temporal variation of *Orchis morio*'s flowering spikes in a 26-year meadow experiment GILMANN and DODD (1998) established that the number of flowering orchids were varied to much higher degree from site to site than in time. In many cases of orchid species similar findings were published by KULL (2002) in his review.

According to Kindlmann and Balounová's study with *Dactylorhiza majalis* the irregular flowering pattern may be typical for sites with temporarily or steadily declining populations. Several environmental factors (e.g. unsuitable habitat, wrong management, unsuitable weather conditions) can contribute to the irregular flowering in a given site (KINDLMANN and BALOUNOVÁ 1999).

The only conclusion can be drawn from the intensive fluctuation of the flowering individuals is whether the environmental conditions were favourable for the reproduction or not (when there are many flowering individuals, such year is called a "good orchid year"). To follow the dynamics of the population, we cannot leave out of consideration that the fluctuations in the number of flowering plants counted is not a true indicator of population size because juvenile plants were not counted in the population and only a proportion of the adult plants flower each year (CAREY et al. 2002).

Number of flowers and fruits on the spike

The number of flowers is a characteristic feature in the identification of the different *Himantoglossum* species. While *H. hircinum* is characterised by dense inflorescence with many (40-120) flowers, the *H. adriaticum* has a loose inflorescence with only 25-50 flowers (BAUMANN and KÜNKELE 1982, BUTTLER 1986, ADLER et al. 1994).

In spite of the considerable differences between the extreme values of reproductive traits studied, among them three (except for number of seedpods) showed low temporal variability in the whole study period (cf. Table 1). In the case of the number of seedpods, however, the variability was of very large extent indicating the great uncertainty in the annual fecundity.

The number of flowers and the height of the stem are similarly stable characteristics in the case of the *Dactylorhiza lapponica* (OIEN and MOEN 2002) and the number of flowers per inflorescence does not vary greatly in *Tipularia discolor* and *Liparis lilifolia* populations. Observed differences in flowering and fruiting are most likely to be influenced by historical events at the individual level, especially costs associated with sexual reproduction and leaf herbivory (WHIGHAM and O'NEIL 1991). Otherwise, the height of spike and the number of flowers per inflorescence were also a year-depending characteristics in the case of *Ophrys apifera* (WELLS and COX 1991).

The rate of the fecundity is usually a variable character and the low levels of fruit-set are typical among wild orchids (PROCTOR and YEO 1973, SUMMERHAYES 1968). Only 7% of the flowers got fertilized in *Orchis purpurea* populations in Belgium, and the number of seedpods seems to be depended on the number of flowers on spike. The large inflorescences produced significantly more fruits than the smaller inflorescences and this phenomenon proved to be independent of population (JACQUEMYN et al. 2002). Other orchid species show just the opposite.

Fruit-set production is not related to the number of flowers or their density, suggesting that pollination and/or seed set varies between years (CAREY et al. 2002, CAREY and FARRELL 2002). For *H. adriaticum* 2004 was an extremely good year, when the orchid produced 14 seedpods per plant, in spite of the fact that the number of flowering plants was relatively low and the average number of flowers per plant was the lowest in that year. No correlation was found between the fecundity rate and the height of flowering plants as well as the average length of the inflorescences. In the case of *H. hircinum* populations in South-England 1993 was an outstanding year, when the mean number of seedpods produced per plant was exceptionally high, nearly 20, in contrast with the regular 5 or even lower values (CAREY et al. 2002). No significant relationship was found between the fruit set and inflorescence size in the case of *Dactylorhiza fuchsii* and *Epipactis helleborine* (WAITE et al. 1991). The reproductive success was not correlated with the number of flowers, but the correlation with the length of inflorescence was found to be significant by other investigations in the case of *Dactylorhiza fuchsii*, in Bohemia (JANECKOVA and KINDLMANN 2002).

Probably, the complicated pollination biology also contribute to the variations of reproductive traits. One of the most important feature is whether the flower produces nectar or not. There is no certainty in the case of the *Himantoglossum* genus, that there is nectar in the spur or not (CAREY and FARRELL 2002). Another important factor is the weather at the time of flowering. If the weather is favourable for the pollinator insects, the fecundity rate is better (LIGHT and MACCONAILL 2002).

Conclusion

There are only few data about *Himantoglossum adriaticum*, because the species was only described not long ago. Although the total number of population, flowering frequency could not be estimate if only flowering individuals are used for monitoring,

however due to the long time period it enable tendencies and temporal variation in population size to be detected.

The examined population is small, and the fluctuation in the number of flowering individuals is relatively large between years, that is, on the basis of flowering plants the population has temporal variability in this site. There are years when the orchid has extremely good fruit productions. On the other hand, these good fruit-producing years, which will insure the long-term survival of the population under suitable environmental conditions, do not coincide with the 'good orchid years', that is years of great number of inflorescences.

Acknowledgements

The authors offer thanks to the Nature Conservation Authorites of the Ministry of Environment and Water for the delivery and usably of data of the Hungarian Biodiversity Monitoring System. We are very grateful to Marion Pfeifer for her valuable comments to an earlier paper, and many thanks to Katalin Szitár for her help in making the Fig. 1.

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DOI:10.24394/NatSom.2009.15.41 | Natura Somogyiensis | 15 | 41-52 | Kaposvár, 2009

Vegetation of Külső-Somogy in Hungary III Regional diversity and pattern of abandoned fields and plant invasion

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Salamon-Albert, É. & Horváth, F.: *Vegetation of Külső-Somogy in Hungary III. Regional diversity and pattern of abandoned fields and plant invasion.*

Abstract: A systematic overview and landscape pattern of abandoned fields and plant invasion according to semi-natural habitats in Külső-Somogy are summarized based on MÉTA method. Areal distribution of abandoned fields and plant invasion was mostly overlapping, centres were revealed from the North-Western and South-Eastern parts. Dry and semi-dry grasslands (e.g. E habitats) were significant to abandoned fields and/or set of alien species, mesic deciduous woodlands (e.g. K2), dry and rocky woodlands (e.g. L2a) and bush vegetation (e.g. P2a and P2b) to the centres of plant invasion. Cover of threatened habitat types, number and ratio of invasive species were analysed and compared to national results. Average threatening of real semi-natural habitats were greater in Külső-Somogy than similar ones at national scale. Hardly threatened habitat types were among woodlands in great proportion. Most invaded semi-natural habitats are riverine shrublands and woodlands, marshes, mesic deciduous woodlands in lowlands, dry open *Quercus* woodlands and rocky woodlands. Dry closed *Quercus* woodlands, colline and montane hay meadows and euhydrophyte habitats were the least invaded groups. Among alien species *Robinia pseudo-acacia, Solidago* spp., *Ailanthus altissima* and some other species were the most significant. *Prunus serotina* is sporadic, *Reynoutria* spp. is absent in the region. By the analyses a regional order of invasive species importance was created. It is clearly verifiable that plant invasion is a more serious problem than spreading of abandoned fields in Külső-Somogy region.

Keywords: abandoned field, alien species, GIS database, MÉTA method, habitat patches, landscape ecology

Introduction

Külső-Somogy is a characteristic hilly landscape with several types of semi-natural woodlands and grasses in the middle of Transdanubia belonging to Kaposense and Somogyicum phytogeographical regions. This landscape is a poorly documented area in Transdanubia and in Hungary as well according to its natural vegetation. Last years some systematic overview were published about semi-natural habitat diversity and pattern of this region (e.g. Salamon-Albert and Horváth 2008a, 2008b). They were presented as the reference verifying and finding new occurrences of vegetation types and corresponding analyses of existing semi-natural habitats.

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

Vegetation pattern with different origin and former land use could be developed in abandoned fields. Abandoned fields can be established from unused vineyards, arable lands or orchards. Some annual species strongly affect the vegetation composition of 2-5 year-old abandoned field, but perennial species dominate on the 5-10 year ones. On the 10-50 year-old abandoned fields semi-natural grasses, on the oldest ones (50- years) woody vegetation could exist.

Biological invasion is one of the most important danger in habitat changes, connected to fragmentation of natural vegetation (CRONK and FULLER 2001). Status of biological invasions and actual knowledge about species concerned in Hungary was earlier summarized (TÖRÖK et al 2003, MIHÁLY and BOTTA-DUKÁT 2004, BOTTA-DUKÁT and MIHÁLY 2006). There are numerous papers as case studies from smaller areas of Hungary about alien species responsible for biological invasion (e.g. BALOGH 2001), but not in Külső-Somogy region. Data on species distribution and habitat preferences of them could be gained by combining with maps and any other databases, e.g. phytosociological ones (BOTTA-DUKÁT 2008).

In our work, as the third study of a landscape series, we present and evaluate basic statistics of abandoned fields and plant invasion connected to semi-natural woodlands and non-woody habitat types and groups in Külső-Somogy region. Analyses are executed for the cover of abandoned and invaded areas at landscape scale, and for 15 selected alien species in habitat types and groups with MÉTA method and mapping (GIS database for Hungarian Habitats, Magyarországi Élőhelyek Térképi Adatbázisa, HORVÁTH et al 2008) based on a landscape ecology oriented protocol fitted to the whole territory of Hungary (BÖLÖNI et al 2007, MOLNÁR et al 2007).

Material and method

Region of Külső-Somogy (Fig. 1) is located south from Lake Balaton, bordered by Kapos River, Sió Channel and Pogány Valley in the territory of Somogy and Tolna counties. Its total extension is 3000 km^2, mean altitude is 186 m a.s.l., 200-300 m a.s.l. especially on the ridges of the hills. The bedrock is limestone covered by loess on the surfaces of the crests trended to north-south direction. In the western part of the area (West Külső-Somogy) the ridges of the hills are exposed to erosion and derasion. The eastern part of the region (East Külső-Somogy) is dissected with valleys parallel to Lake Balaton and the south part of it (South Külső-Somogy) is a horizontal loess plateau with moderate slope to Kapos River. Running through the main north-south valleys, Jaba Stream and Koppány Stream flow from west to east. According to the data of regional meteorological stations (Szabadhídvég, Kaposvár) the mean temperature is -2.5 C° in January, +20.5 C° in July, the sum of precipitation is 650 mm per year. There are some cities and many small villages, so Külső-Somogy is not a frequent region from an economical point of view (MAROSI and SOMOGYI 1990). On the basis of drought-sensitivity index several vegetation types existing in the south-eastern part of the region could be endangered in climatically dry periods (NÉMETH et al 2004).

Data collection and analyses

Field data collection was executed between 2003-2006 as a grid-based, satellite-image supported (SPOT4), multi-attributed, large-scale mapping method so called MÉTA (MOLNÁR et al 2007). It is based on Á-NÉR2003 mapping and habitat guide (BÖLÖNI et al 2007). The goals of the research were: 1) to collect data of all natural and semi-natural

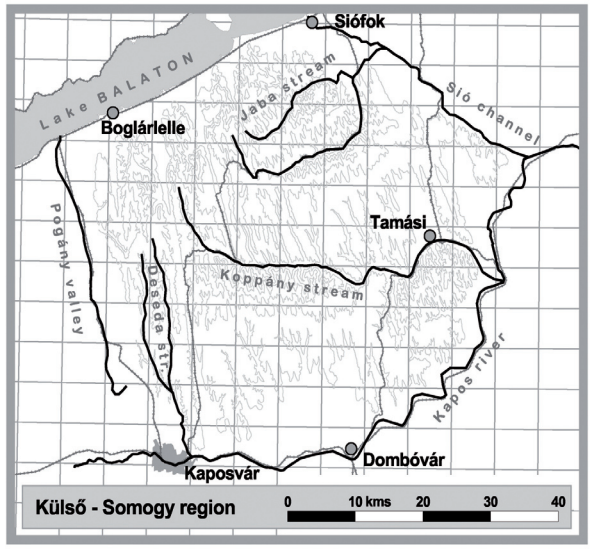

Fig. 1: Territory, settlements, geographical and hydrological elements of Külső-Somogy

habitat types in Hungary 2) to create maps of semi-natural vegetation patches and 3) to evaluate landscapes with vegetation types and their attributes as well, 4) to evaluate territorial extension and spatial distribution of the abandoned fields that could be the basis of grassland regeneration. The database is constructed on a hexagon grid system of 35 hectars covering the whole area of the country as the primary mapping units (HORVÁTH et al 2008). Approximately 100 hexagons are associated into a quadrat at landscape scale as a secondary mapping unit. In hexagons main existing habitat types, their roughly estimated areas and several vegetation attributes are listed (e.g. naturalness, neighbourhood, land use). This multi-attributed database is suitable to determine natural-based habitat quality, to estimate the relations of the wastelands in the Hungarian landscape and to compose the prognosis of future changes for vegetation and landscape. For more details see HORVÁTH and POLGÁR (2008).

On the basis of MÉTA method a basic statistical analysis and evaluation was carried out on one hand, spatial thematic map were constructed for displaying the territory and extension of abandoned and invaded fields. Relative areal proportion (ha) of abandoned fields and alien species were calculated for quadrats and compared with each other connected to semi-natural habitats. Data were displayed in tables and on GIS thematic maps with appropriate additional layers (e.g. settlements, hydrological and geographical elements) using ESRI ArcView 3.3 software from valid hexagons of 95 quadrats. Habitat nomenclature is by MOLNÁR et al (2008), species names are by SIMON (2000).

In Külső-Somogy region 48 semi-natural habitat types of woodlands and grasslands were detected and analysed previously (SALAMON-ALBERT and HORVÁTH 2008a, 2008b). In this analysis, they were aggregated into wider categories as habitat groups (abbreviations of categories are listed in brackets, meaning of them see MOLNÁR et al 2008): euhydrophyte habitats (A1, A23, A3a); marshes (B1a, B2, B3, B4, B5, B6, BA); flushes and transition mires (C1); rich fens, eu and mesotrophic meadows and tall herb communities (D2, D34, D5, D6); colline and montane hay meadows (E1, E2); dry and semi-dry closed grasslands (H4, H5a, H5b); riverine shrublands and woodlands (J2, J5, J6);

mesic deciduous woodlands in lowlands or on hills and mountains (K1a, K2, K5); closed dry deciduous woodlands (L1, L2a, L2b, L2x, L5); open dry deciduous woodlands (M1, M2); bush vegetation and woodland margins (J1a, P2a, P2b, M7, M8); rocky forests (LY4); other treeless habitats (OA, OB, OC); other tree-dominated habitats (RA, RB, RC, RD, P45, P7). Sporadic and insignificant habitat types were missed out from the summarized analyses (e.g. C1).

Alien species was used as a binary variable (yes/no) in the database. The sum of estimated area in all hexagons and in hexagons where invasion threatens the habitats (by the presence of any alien species), results in the total area of the threatened habitats respectively. The following alien species were considered: Ail = *Ailanthus altissima*, Aneg = *Acer negundo*, Amor = *Amorpha fruticosa*, Ascl = *Asclepias syriaca*, Ast = *Aster* spp., Celt = *Celtis occidentalis*, Ech = *Echinocystis lobata*, Elae = *Elaeagnus angustifolia*, Frax = *Fraxinus pennsylvanica*, Phyt = *Phytolacca americana*, Pru = *Prunus serotina*, Rey = *Reynoutria* spp., Sol = *Solidago* spp., Rob = *Robinia pseudo-acacia*, Vit = *Vitis* spp. and Oth = some additional but unnamed species. Hardly distinguished related species were aggregated into a genus (e.g. *Reynoutria* spp.). Among the data on plant invasion collected in the MÉTA survey annual aliens of arable fields and species of cultivated (e.g. forest) plantations were not included. In the tables sum cover of habitat types threatened by plant invasion, number and ratio of invasive species in a habitat type, and the number and ratio of habitats threatened by the given species was calculated. Regional data of habitat types which are similar from the point of invasion were also especially amalgamated for the comparison with national results (see BOTTA-DUKÁT 2008).

Results

Threatened habitats and diversity of alien species

Results of the study have shown that habitats occurring in Külső Somogy region are differently referred to plant invasion (Table 1). Relative area of habitats threatened by alien plant species varies between 0 and 100%. Extremities (0 and 100) can be seen in case of fragmented or sporadic habitat types (e.g. A3a, LY4, M2) and it is according to their extensions. 29 habitat types (60.4%) have more than 50% relative area threatened by any alien species. Hardly threatened vegetation types – where areal ratio is over 50% - are in greater proportion among woody habitat types (65.4% from J1a to RD) than among non-woody ones (59.1% from A1 to OC) as well as the average of threatened areas in woodlands (60.8%) than in grasslands (56.1%). In case of euhydrophyte habitats (A1, A23, A3a) and transition mires (C1) there are no vegetation patches threatened by any plant invasion. There are no correlation between high proportion of threatened area and proportion of alien species in habitat patches.

15 most important and some additional but unnamed other alien species were detected in habitats (Table 1). Alien species occured with more than a half total number in a third of habitat types both in grasslands (31.8%) and woodlands (30.8%). Occurrence of *Robinia pseudo-acacia, Solidago* spp., *Ailanthus altissima* and some other species is the most significant. Among them *Solidago* spp. and some other species are the most frequent in patches of grassland habitats, *Robinia pseudo-acacia* and *Ailanthus altissima* are the most frequent in patches of woodland habitats. Least threatening species are *Prunus serotina, Reynoutria* spp., *Aster* spp., *Celtis occidentalis* and *Fraxinus pennsylvanica* in the habitats. It can be observable that the most threatening species in habitat groups by MOLNÁR et al (2008) are of colline and montane hay meadows, dry and semi-

dry closed grasslands, other treeless habitats, dry closed woodlands, bush vegetation or woodland margins (especially P2a, P2b) and other tree-dominated habitats.

Analysing invasive danger in habitat patches fitted to national scale according to BOTTA-DUKÁT (2008), 11 habitat groups can be defined in Külső-Somogy region (Fig. 2). Degree of threatening in habitat groups varies between 0 and 94 percentage. The most invaded habitat groups by areal proportion, that is over 80%, are riverine shrublands and woodlands, marshes, mesic deciduous woodlands in lowlands, dry open Quercus woodlands and rocky woodlands. The high invasibility of floodplains is generally described in the literature owing to the continuous disturbance by floods and propagule spreading by the water (e.g. PYŠEK and PRACH 1994, PLANTY-TABACCHI et al 2001). Opposite to rocky woodlands belong to the most resistant habitats generally. The least invaded habitat groups, that is under 40% areal proportion, are dry closed *Quercus* woodlands and euhydrophyte habitats. Euhydrophyte habitats proved to be not threatened because the lack of species acclimated to this habitat type but originate from thermal water and present in Hungary (see KIRÁLY et al 2006).

Next see the results of threatened area in habitat groups by 15 most invasive and some other alian plant species according to national scale (Table 2). In the treeless habitat groups (marshes, wet meadows) the most important invasive species are the *Solidago* spp., and in the woody ones (especially riverine shrublands or woodlands and mesic deciduous woodlands on lowlands) *Robinia pseudo-acacia* dominates. High proportion of territories invaded by the two previous species mentioned were also revealed in dry and semi-dry grasslands, colline and montane hay meadows and dry, open and closed *Quercus* woodlands. *Ailanthus altissima* is frequent in dry and semi-dry closed grasslands, mesic deciduous woodlands of lowlands and mountains and dry open *Quercus* woodlands. *Acer negundo* in marshes, *Echinocystis lobata* in riverine woodlands, *Elaeagnus angustifolia* in dry and semi-dry closed grasslands, *Phytolacca americana* in rocky woodlands are the locally frequent species. *Reynoutria* spp. are completely absent in any habitat type or group, *Prunus serotina* is a sporadic invasive species of Külső-Somogy region by the database. Some other invasive plant exist in wet, mesic and dry habitat types and groups in the same way. The only exception in plant invasion are the euhydrophyte habitats owing to the total lack of alien species. Above all we can create a regional order of species importance by number of habitat groups with threats: *Robinia pseudo-acacia, Solidago* spp., some others, *Ailanthus altissima, Acer negundo, Asclepias syriaca* and *Phytolacca americana*.

Spatial pattern of abandoned fields and invasion

Abandoned fields were detected altogether in 86 quadrats (90.5%), habitats threatened by plant invasion were identified in 94 quadrats (99%) of Külső-Somogy region. Total territory of the abandoned fields is 6100 ha that is 2.1% to the whole territory of the region, 14.4% to the total vegetation cover. Habitats endangered by plant invasion have 15200 ha cover that is 5.2% to the whole territory of the region and 35.9% to the semi-natural vegetation cover. Areal ratio of habitats threatened by plant invasion to abandoned fields is 2.53. Areal distribution of the two attributes is mostly overlapping and dominate in the North-Western and South-Eastern parts of the region. Abandoned fields occur a tighter (1.5 to 330 ha/quadrat), alien plant species occur in a broader range (1 to 750 ha/quadrat). Minimum proportion value of abandoned fields to a quadrat territory is 0.04%, maximum value is 9.4%, and similar that of habitats endangered by alien species is 0.03% and 21.4%.

In order to display occurrence and spatial distribution of abandoned fields and plant invasion a thematic map was constructed for 95 quadrats of Külső-Somogy region (Fig.

Table 1: Areal ratio of threatening by plant invasion and proportion of alien species in percentage in habitat types of Külső-Somogy. From A1 to OC are non-woody, from J1a to RD are woody habitats according to Molnár et al (2008). All = relative occurrence of a given species in a habitat type, spec = relative occurrence of an invasive species in habitats, * = without additional species. Bold figures represent if proportion/ratio is over 50%, figures in brackets has less cases/number of records than 5. For species abbreviations (e.g. Ail) see chapter Data collection and analyses.

Habitat	Habitat Group A (Molnár et al 2008)	Habitat Group B (Botta-Dukát 2008)	Area of threats	Ail	Amor	Aneg	Ascl	Ast	Celt	Ech	Elae	Frax	Phyt	Pru	Rey	Sol	Rob	Vit	Oth	All
A1	Euhydrophyte habitats	Euhydrophyte habitats	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A23	Euhydrophyte habitats	Euhydrophyte habitats	(0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A3a	Euhydrophyte habitats	Euhydrophyte habitats	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B1a	Marshes	Marshes	**84**	-	1	18	-	4	-	15	3	-	-	-	-	**78**	1	5	1	***53**
B2	Marshes	Marshes	18	-	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-	7
B4	Marshes	Fens	(33)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	Marshes	Eu- and mesotrophic wet meadows	**80**	2	2	10	-	4	-	13	2	-	-	-	-	**83**	4	2	6	***60**
BA	Marshes	---	24	-	-	-	-	-	-	-	-	-	-	-	-	18	7	-	-	13
C1	Flushes and transition mires	---	(0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	Eu- and mesotrophic wet meadows	Eu- and mesotrophic wet meadows	**93**	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	-	-	7
D34	Eu- and mesotrophic wet meadows	Eu- and mesotrophic wet meadows	**52**	2	2	-	8	8	-	4	-	-	-	-	2	**73**	-	4	2	***53**
D5	Eu- and mesotrophic wet meadows	---	**68**	-	-	-	-	-	-	18	-	-	-	-	-	**73**	-	-	-	13
D6	Eu- and mesotrophic wet meadows	---	**91**	-	25	-	-	25	-	-	-	-	-	-	-	**100**	**50**	-	-	27
E1	Colline and montane hay meadows	Colline and montane hay meadows	42	3	3	-	8	5	-	-	3	-	3	-	3	42	26	3	18	***67**
E2	Colline and montane hay meadows	Colline and montane hay meadows	**53**	33	-	-	-	-	-	-	-	-	17	-	-	33	**50**	-	33	*27
H4	Dry and semi-dry closed grasslands	Dry and semi-dry closed grasslands	**68**	19	5	-	19	-	-	-	14	-	-	-	-	14	**57**	-	5	*40
H5a	Dry and semi-dry closed grasslands	Dry and semi-dry closed grasslands	**60**	31	5	-	28	-	-	-	21	-	-	-	-	36	**59**	3	13	***47**
H5b	Dry and semi-dry closed grasslands	Dry and semi-dry closed grasslands	**68**	20	-	-	-	-	-	-	20	-	-	-	-	**80**	**80**	-	**60**	*27
I2	Non-ruderal pioneer habitats	---	(33)	**50**	-	-	**50**	-	-	-	-	-	-	-	-	-	**50**	-	-	20
OA	Other treeless habitats	---	**78**	-	-	13	-	13	-	31	-	-	-	-	6	**94**	25	-	6	*40
OB	Other treeless habitats	---	**63**	8	1	13	10	3	-	6	4	-	3	1	-	8	34	4	25	***80**
OC	Other treeless habitats	---	**70**	2	2	3	27	-	-	-	8	-	2	2	-	**58**	**54**	3	36	***67**

J1a	Bush vegetation/woodland margins	---	4	-	-	17	-	-	-	-	-	-	-	-	-	17	-	-	-	13
J2	Riverine woodlands	---	53	-	-	-	-	-	-	-	-	-	-	-	-	4	2	-	-	13
J5	Riverine woodlands	Riverine shrublands and woodlands	**94**	-	-	4	-	-	-	15	-	-	8	-	-	46	46	-	-	33
J6	Riverine woodlands	Mesic deciduous woodlands of lowlands	**69**	25	-	-	-	-	-	-	-	-	-	-	-	-	**75**	-	-	13
K1a	Mesic deciduous woodlands	Mesic deciduous woodlands of lowlands	**87**	23	-	18	-	-	-	-	-	-	-	-	-	10	**86**	5	23	*33
K2	Mesic deciduous woodlands	Mesic deciduous woodlands of hills	**53**	28	-	7	7	-	-	-	-	-	2	-	-	1	**72**	-	14	*40
K5	Mesic deciduous woodlands	Mesic deciduous woodlands of hills	13	-	-	-	-	-	-	-	-	-	7	-	-	14	29	-	21	*20
L1	Dry closed woodlands	Dry closed Quercus woodlands	45	33	-	-	17	-	-	-	-	-	-	-	-	-	5	-	-	20
L2a	Dry closed woodlands	Dry closed Quercus woodlands	32	18	2	-	5	-	5	-	-	5	5	-	-	10	**73**	-	16	***53**
L2b	Dry closed woodlands	Dry closed Quercus woodlands	**84**	10	-	10	-	-	18	-	-	10	18	10	-	18	**64**	-	-	***53**
L2x	Dry closed woodlands	Dry closed Quercus woodlands	48	**57**	-	-	-	-	-	-	-	-	-	-	-	29	43	-	14	*20
L5	Dry closed woodlands	Mesic deciduous woodlands of lowlands	**(91)**	**50**	-	-	-	-	-	-	-	-	-	-	-	-	**50**	-	-	13
LY1	Rocky woodlands	Rocky woodlands	**91**	-	-	-	-	-	-	-	-	-	**67**	-	-	-	**67**	-	**67**	*13
LY4	Rocky woodlands	Rocky woodlands	(0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M1	Dry open woodlands	Dry open Quercus woodlands	**(100)**	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	13
M2	Dry open woodlands	Dry open Quercus woodlands	**(100)**	1	-	-	-	-	1	-	-	-	-	-	-	1	1	-	-	27
M6	Bush vegetation/woodland margins	Dry open Quercus woodlands	**77**	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	7
M8	Bush vegetation/woodland margins	---	**70**	-	-	-	14	-	14	-	-	-	-	-	-	-	43	-	-	20
P2a	Bush vegetation/woodland margins	---	**75**	1	5	37	3	-	-	18	5	3	3	-	2	**65**	**53**	13	2	***80**
P2b	Bush vegetation/woodland margins	---	**76**	18	3	3	13	-	3	2	7	2	2	-	2	21	**72**	8	2	***87**
P45	Other tree-dominated habitats	---	**94**	29	-	-	14	-	-	-	-	-	-	-	-	-	**57**	-	-	20
P7	Other tree-dominated habitats	---	**60**	-	-	-	7	-	-	-	-	-	7	-	-	36	**57**	7	21	*33
RA	Other tree-dominated habitats	---	37	7	-	36	-	-	-	10	-	5	-	-	-	32	43	7	5	***47**
RB	Other tree-dominated habitats	---	**73**	9	1	**52**	4	3	1	19	9	4	-	-	7	**67**	52	3	7	***87**
RC	Other tree-dominated habitats	---	**76**	24	1	11	11	-	1	-	-	1	1	-	-	17	8	6	10	***67**
RD	Other tree-dominated habitats	---	27	23	4	16	6	-	6	2	6	4	4	-	-	17	47	2	9	***80**
Spec				**56**	31	33	38	17	17	27	25	17	31	6	13	**67**	**77**	31	**50**	

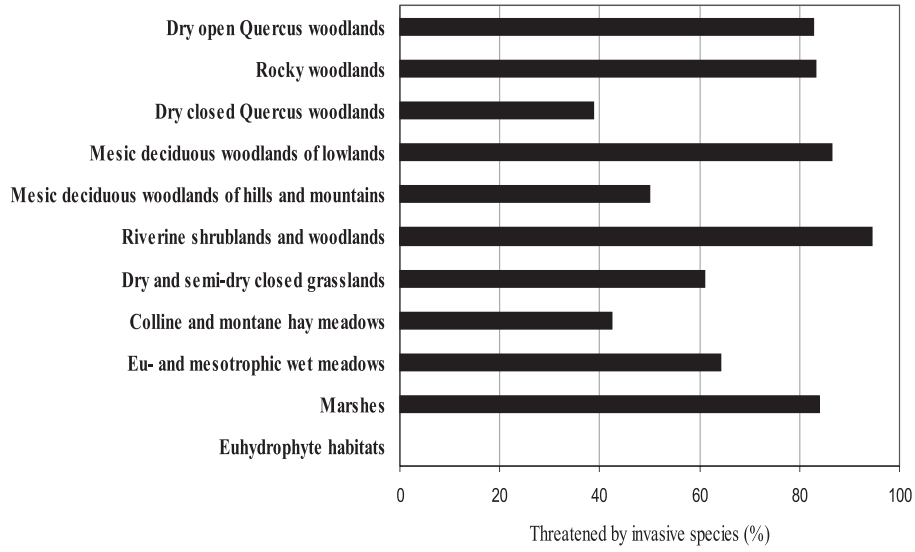

Fig. 2: Area of habitat groups threatened by alian plant invasion in percentage in Külső-Somogy. For habitat aggregation see Table 1 and BOTTA-DUKÁT (2008). Number of cases less than 5 and missing habitat groups are excluded.

3). This map emphasizes spatial variation of two series of target attributes: cover and areal distribution of abandoned fields and sum of habitats threatened by alien plant species. In the first step territorial extension of them were added by a previously standardized consensus scale (<2 ha, 2-15 ha, 15-200 ha, 200-500 ha, >500 ha). Data analyses were based on valid hexagons, spatial covering maps were displayed at quadrat level referred to the MÉTA SQL database. Spatial distribution and summarized covering of abandoned fields and alien species are displayed and compared to each other and to main associated habitat groups and types of woodlands and grasslands.

We can compare territorial distribution of abandoned fields and invasive species to semi-natural habitat types (see Fig. 3 and SALAMON-ALBERT and HORVÁTH 2008a, 2008b). Selected vegetation groups are significant to abandoned fields and/or set of alien species: dry and semi-dry grasslands (especially E habitats) to abandoned fields; mesic deciduous woodlands (especially K2), dry and rocky woodlands (especially L2a) and bush vegetation (especially P2a and P2b) to the centres of plant invasion. According to occurrence and frequency of alien species pool, stands of mesic K2 and dry L2a woodlands could be planted and originated from one-time grassland habitats. Overlapping with P2a and P2b bush habitats makes one-time clear-cuttings probable.

Table 2: Area of habitat groups in percentage where selected invasive species occured in Külső-Somogy. For habitat aggregation see Table 1 by Botta-Dukát (2008). Number of cases less than 5 and missing habitat groups are excluded (e.g. fens). Bold figures represent if proportion is over 50%.

	Ail	Amor	Aneg	Ascl	Ast	Celt	Ech	Elae	Frax	Phyt	Pru	Rey	Sol	Rob	Vit	Oth
Dry open Quercus woodlands	25	-	-	-	-	25	-	-	-	-	-	-	25	25	-	-
Rocky woodlands	-	-	-	-	-	-	-	-	-	43	-	-	-	43	-	43
Dry, closed Quercus woodlands	10	-	-	1	-	4	-	-	4	5	3	-	8	34	-	6
Mesic deciduous woodlands of lowlands	35	-	28	-	-	-	-	-	-	-	-	-	25	**86**	-	25
Mesic deciduous woodlands of mountains	25	-	8	2	-	-	-	-	-	1	-	-	6	38	-	2
Riverine shrublands and woodlands	-	-	**77**	-	-	-	**51**	-	-	2	-	-	5	**77**	-	-
Dry and semi-dry closed grasslands	39	8	-	26	-	-	-	28	-	-	-	-	31	49	2	7
Colline and montane hay meadows	5	1	-	7	-	-	-	-	-	5	-	-	31	20	-	13
Eu- and mesotrophic wet meadows	1	-	5	5	9	-	8	-	-	-	-	-	**58**	1	-	2
Marshes	-	-	31	-	9	-	16	5	-	-	-	-	**73**	1	1	10
Euhydrophyte habitats	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Habitat groups with threats	7	2	5	5	2	2	3	2	1	5	3	-	9	10	3	8

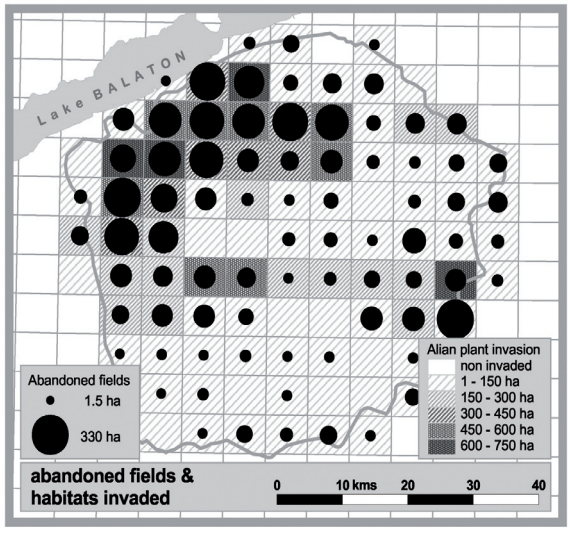

Fig. 3: Territorial proportion of abandoned fields and plant invasion in Külső-Somogy region

Discussion

In our study we have discussed the areal proportion and distribution patterns of abandoned fields and plant invasion by threatened habitats and diversity of alien species at landscape scale. Analysing regional extension data, there are some definite conclusion that is characteristic for Külső-Somogy. Threatened habitats occur among grasslands and woodlands as well, both in wet, mesic and dry habitat types and groups. There was an evidence in case of riverine woodlands and marshes with high proportion of threatenings. Some striking was revealed in case of dry open *Quercus* woodlands and rocky woodlands with hard threatening also in contrast with their high potencial resistance. Comparing regional data to national scale according to corresponding habitat types and groups, average threatening of patches are greater in Külső-Somogy. Threatened habitats of marshes, dry and semi-dry closed grasslands and dry open or closed and rocky woodlands have more than twice proportion in the region than in Hungary overall. Land use practice or threatening state of habitat types can be likely interpereted by spatial overlapping with plant invasion or location of abandoned fields.

Generally occuring invasive species are *Ailanthus altissima, Solidago* spp., *Robinia pseudo-acacia* and besides them some unnamed species that need to be validated. Invasive species that are specific for habitat groups are *Acer negundo, Echinocystis lobata, Elaeagnus angustifolia* and *Phytolacca americana. Prunus serotina* is sporadic, *Reynoutria* spp. are fully absent in Külső-Somogy region, their data might be underestimated or deficient in the landscape. Among most important invasive species, 4 ones occur with greater frequency than at national scale (*Acer negundo, Ailanthus altissima, Solidago spp., Robinia-pseudo-acacia*), two species have less threatening potential, *Amorpha fruticosa* and *Fraxinus pennsylvanica*.

Acknowledgements

Data for the analyses were delivered from MÉTA workgroup, Institute of Ecology and Botany of the Hungarian Academy of Sciences (Vácrátót, Hungary). The project was financed by the grant of OM-NKFP/2002: „Magyarország természetes növényzeti örökségének felmérése és összehasonlító értékelése". Further participating botanists are Bódis J., Botta-Dukát Z., Csiky J., Dávid J., Friedrich Á., Horváth A., Szalóky I., Juhász M., Kádár G., Király G., Mányoki G., Ortmann-Ajkai A., Pándi I., Pfeiffer N., Szabó A., Varga A. and Zsidákovits J. contributed to field data collection.

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Külső-Somogy vegetációja III. Parlagok és inváziós növények diverzitása és tájmintázata

SALAMON-ALBERT ÉVA & HORVÁTH FERENC

A tanulmány Külső-Somogy természetközeli fás- és fátlan élőhelytípusait érintő parlagterületek és inváziós növényfajok területi előfordulását és tájmintázatát értékeli az országos MÉTA adatbázis alapján. A parlagok és a növényi invázió területi elterjedése nagymértékben átfedőnek bizonyult, súlypontjai a régió észak-nyugati és dél-keleti részében vannak. A zárt szárazgyepek elterjedése egybeesik a parlagok és az inváziós fajok súlypontjaival, a mezofil síkvidéki erdők a száraz és sziklás erdők és a cserjések egyes típusai az inváziós centrumokkal fednek át. A veszélyeztetett élőhelyek relatív területi borítását illetve az inváziós fajok számát és arányát az országos eredmények tükrében is értékeltük. A természetközeli élőhelyek átlagos inváziós veszélyeztetettsége a régióban jelentősen nagyobb volt, mint a hasonló élőhelyek országos átlaga, különösen az erdei élőhelyeken. Legveszélyeztettebbnek a láp- és ligeterdők, a mocsarak és a lápok, a mezofil síkvidéki erdők, a nyílt tölgyesek és a sziklás erdők bizonyultak. Az inváziónak legkevésbé kitett élőhelyek a zárt tölgyesek, a dombvidéki gyepek és a hínárnövényzet. A felvételezett inváziós fajok között a *Robinia pseudo-acacia*, a *Solidago* fajok, az *Ailanthus altissima* és egyéb, később nevesítésre szoruló taxonok a legjelentősebbek. A *Prunus serotina* szórványos, a *Reynoutria* fajok hiányoznak a régióból. Az adatok alátámasztották, hogy a növényi invázió komolyabb probléma Külső-Somogyban, mint a parlagterületek nagy kiterjedése.

DOI:10.24394/NatSom.2009.15.53 | Natura Somogyiensis | 15 | 53-56 | Kaposvár, 2009

New data on the distribution of Large Golden Ringed Dragonfly (*Cordulegaster heros* Theischinger, 1979) (Odonata) in Zselic hills

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Csordás, L., Ferincz Á., Lőkkös A., Rozner Gy.: *New data on the distribution of Large Golden Ringed Dragonfly (Cordulegaster heros Theischinger, 1979) (Odonata) in Zselic hills.*
Abstract: The earliest record of this species is dated back to 2005. Intensive investigations, habitat mapping and ecological research of *C. heros* were started in 2008. Our researches were focused on the larval instars and also on the conservation of the habitats. Most of the discussed *C. heros* populations were strong with high abundance. In the present study, we publish the results of the records done in 2008 and 2009.

Keywords: Zselic, dragonflies, *Cordulegaster heros*, faunistic

Introduction

The Large Golden Ringed Dragonfly (*Cordulegaster heros* Theischinger, 1979) is our only one strictly protected dragonfly species included in the Hungarian Red Book and also on the red lists and red books of several other nation's as well. It is also a Natura 2000 indicator species.

Eralier, Ambrus et al. (1996) and Kovács et al. (2004, 2006) reported the species from Western Transdanubia and Tóth (2004, 2006a) from Mecsek and Zselic Hills.

In the Zselic Hills, firstly, Tóth (2006) reported the species from Szenna: Denna forest on 17th of March, 2005. Two larvae were collected in Mátyás-kút (Mátyás well). In the same place, imagoes and exuviums were collected on 5th of July, 2006 (Tóth 2006). In 2007, one specimen was captured in Gyűrűfű, during the Biodiversity Days (Tóth 2009).

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

In 2008, we started the investigation of the distribution and breeding places of the species. Later, we extended our investigations for the ecology and general habitats as well.

Imagoes, are able to fly far from their breeding habitats and occur in distant places which are not suitable for reproduction.

For nature conservation point of view, the conservation of the breeding habitats is the most important, therefore we focused on these. In the present study, we discuss the collectings done in 2008 and 2009.

Methods and material

Imagoes were collected with 50 cm diameter net. After catching and identification, all imagoes were released. For exuviums, we checked the shoreline vegetation, tree trunks, bushes and artificial objects as well. For collection of larvae, we used 30 and 40 cm steel nets, depending on the size and depth of the waterflows.

Garmin Geko 201 and Trimble Juno ST GPS receivers used for localization and ArcPad software for data fixation. Data were processed with ArcGIS 8.0 software.

Results

The results are communicated in the following order: village, locality, date, (EOV X-coordinate, EOV Y-coordinate (Hungarian Grid)), number of individuals and stage of development.

Abbreviations:
larv. – larva
ex. – exuvium
* - these coordinates are not precise, only indicative. They mark the extension of the sampling site.

Imagoes:
Szenna: Mátyás-kút, 23. 06. 2008., (Eov 545607, 101319)*, 2, 16. 06. 2009, 3, Gálosfa: Csepegő-forrás, 25. 06. 2008, (Eov 563240, 99298)*, 2, Kaposvár: Gyertyános-völgy, 17. 07. 2008., (Eov 553438, 110334), 1, Tormás: Hajnal-kút, 17. 07. 2008, (Eov 566790, 93694), 1, Ibafa: Gyertyán-kút (Sormás-patak), 17. 07. 2008. (Eov 567034, 91267)*, 4.

Larvae and exuviums:
Bükösd: Gorica, (Rudolf-kút), 22. 07. 2009 (Eov 569430, 88853), 1 larv., (Eov 569470, 89309), 1 larv., Dinnyeberki: Sándor-árok, 11. 10. 2008, (Eov 564042, 85526), 1 larv., 18. 06. 2009., (Eov 564036, 85379), 1 larv., Dinnyeberki: Isten-kút, 11. 10. 2008, (Eov 564000, 85482), 2 larv., Ibafa: Gyertyán kút (Sormás-patak), 10. 11. 2008., (Eov 566743, 91157)*, 4 larv., Ibafa: Gyertyánkút (Sormás-patak), 04. 03. 2009, (Eov 566971, 91232)*, 9 larv., 04. 03. 2009., (Eov 566738, 91085), 2 larv., Ibafa: Gyűrűfű (Isten-kút), 08. 03. 2009., (Eov 563997, 85481), 1 larv., Ibafa: Gyűrűfű (Sándor-patak), 08. 03. 2009, (Eov 564193, 86066)*, 6 larv.,; (Eov 564037, 85530), 4 larv., Ibafa: Sormás-patak, 18. 06. 2009., (Eov 566702, 90769)*, ex., 17; Szenna: Mátyás-kút, 23. 06. 2008., (Eov 545838, 101355)*, 13 ex., 17. 07. 2008, (Eov 545882, 101424), 1 ex., 09. 03. 2009., (Eov 545911, 101564)*, 49 larv., (Eov 545896, 101461)*, 9 larv., 16. 06. 2009. (Eov 545736, 101372)*, 14 ex., 30. 06. 2009, (Eov 545784, 101327), 1 ex., Zselickisfalud: Kardosfa-puszta, Márcadó-árok, 16. 06. 2009., (Eov 550432, 99923), 1 ex., 1 larv.

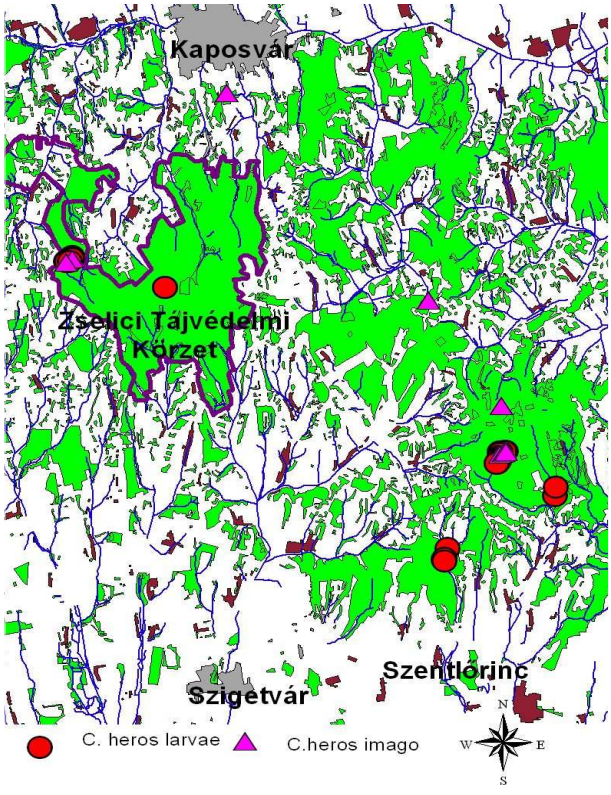

Fig. 1: Larva and imago collected data in Zselic hills

Discussion

There are several significant differences between brooks of the Northern and the Southern Zselic. The Southern brooks have high and constant flowrate till the Northerns have low and fluctuating, most of them get dry time by time. Since the larva of Cordulegaster heros has long, even 5 years development period, the species has need brooks with constant waterflow.

- The dragonfly populations are strong in the brooks of South Zselic like Sormás-patak or Sándor-árok. In future, further habitats are likely to be discovered in this region. .
- In the northern area, waterflows have fluctuating flowrates and frequently dries out. Protection of these habitats are still important, since minor populations were also detected here and in wet climatic periods, these habitats may maintain small populations. Good example for this the Márcadó-árok. This brook is very small, its water-depth is only few centimeters, 20-30 cms wide and its total length on surface is not longer than 100 m. Even in this small brook, we were succeed to find exuvium and larva as well. Based on the small number of larvae and exuviums found, the population density could not be larger than 1 or 2 specimens in this 100 m section. In spite of small population density, the protection and conservation of these minor habitats is still important. This finding

calls for further research of the minor watercourses of the region like Csepegő-forrás (Csepegő spring) or Gyertyános-völgy (Gyertyános Valley) near Kaposvár.

The present populations of the Large Golden Ringed Dragonfly (Cordulegaster heros Theischinger, 1979) is strong with locally high abundance. For the conservation of this, we propose the followings:

The breeding habitats shall always be covered by forest. The clear cutting of forests shall be prohibited in these areas. On the habitats of the strongest populations, forest reservations shall be established. Selective woodcutting is proposed for the other habitats of the dragonfly.

Larvae are sensitive for drying and hardly able to escape from direct radiation. Therefore, the forest-cover of these areas shall be protected. Furthermore, the flowrates of the brooks shall always be checked and done the maintenance work whenever necessary.

Larvae could not live in slow water with low oxygen level. Therefore we should preserve the original condition of the watercourses and also keep them free of toxic materials and agricultural nutrition.

Acknowledgements

We would like to express our thanks to András Pintér for help in sampling and also to the Fridrich family for the accommodation in Gyűrűfű they provided.

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DOI:10.24394/NatSom.2009.15.57 | Natura Somogyiensis | 15 | 57-68 | Kaposvár, 2009

Data to the Lamellicornia fauna of the Republic of Macedonia (Coleoptera: Lamellicornia)

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Rozner, I. & Rozner, Gy.: *Data to the Lamellicornia fauna of the Republic of Macedonia (Coleoptera: Lamellicornia).*

Abstract: Between 1976 and 1998 researchers of the Hungarian Entomological Society conducted 9 collecting trips to Macedonia. In this paper the authors provide a list of Lamellicornia with collecting data, collected on these trips. 10 Lamellicornia families, 42 genera, 99 species are listed. The records of 15 species are new as previous published records of these do not exist. The newly recorded species are: *Platycerus caraboides* (L.), *Lethrus apterus* (Laxm.), *Lethrus elephas* Reitter, *Ochodaeus chrysomeloides* (Schrank), *Aphodius pusillus* (Herbst), *A. quadriguttatus* (Herbst), *A. coenosus* (Panz.), *A. sphacelatus* (Panz.), *A. biguttatus* Germ., *Onthophagus ovatus* (L.), *O. panici* Petr., *O. sericatus* Reitt., *O. similis* (Scriba), *Amphimallon assimile* (Herbst), *A. ochraceum* (Knoch).

Keywords: faunistics, biodiversity, beetle, Macedonia

Introduction

Between 1976 and 1998 researchers of the Hungarian Entomological Society conducted 9 collecting trips to the Republic of Macedonia (formerly Yugoslav Macedonia). In this paper the authors provide a list of Lamellicornia with collecting data, collected on these trips.

The years of the collecting trips and their participants:

1976: Yugoslav Macedonia - Imre Balogh, Attila Podlussány, Lajos Podlussány, György Rozner, István Rozner, Auguszta Rozner
1978: Yugoslav Macedonia - István Rozner, Auguszta Rozner
1981: Yugoslav Macedonia - Attila Podlussány, György Rozner, István Rozner, Auguszta Rozner
1982: Yugoslav Macedonia - Lajos Podlussány, István Rozner, Auguszta Rozner, dr. Sándor Tóth
1996: Republic of Macedonia - Attila Podlussány, István Rozner, Dezső Szalóki
1997: Republic of Macedonia (3 collecting trip) - Attila Podlussány, Antal Rozner, György Rozner, Ibolya Rozner, István Rozner, Auguszta Rozner.
1998: Republic of Macedonia - András Orosz, Attila Podlussány, István Rozner

This article contains the data of scarabaeoid material obtained in 9 collecting expedition with 10 participants.

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

Material and method

The collected material was processed by István Rozner and György Rozner. The list of species is composed after BARAUD (1992). Distribution and level of occurrence of the species in Macedonia are based on the works of René Mikšić and our own experiences.

The list of taxa contains 10 families, 42 genera and 99 species.

Data and abbreviations of the species list

The data is shown int he list of species in the following manner: family and genus names in the **bold** and ***bold italics***, species in the *italics* synonyms as shown in Hungarian literature in the *italics* with brakets, names of food plants also with italics and districts with regular letters, collecting localities and related data such as altitude, time of collecting and the names collectors abbreviated. Notes regarding the species are marked with the - sign.

Abbreviations:

Mt, Mts= hegy, hegység, mount, mountain; ***Mon***= Kolostor, monastir; ***prov***= tartomány, megye, province, county; ***Pl***= hegység, Planina, mountain; ***Sv***= szent, sveti, saint; ***V***= völgy, valley

Abbreviation of the collectors' names (surnames first):

PA = Podlussány, Attila; ***RA*** = Rozner, Auguszta; ***RAN*** = Rozner, Antal; ***RI*** =Rozner, István; ***RIB*** = Rozner, Ibolya

Results

List of species and collecting data

Lucanidae

Dorcus MacLeay, 1819

Dorcus parallelepipedus (Linnaeus, 1758) - prov. Radoviš: Radoviš, 1976. VI. 28-29., RI; prov. Skopje: Skopska Crna Gora, 500-600 m, Mon. Sv. Jovan, 1998. VI. 8, RI; prov. Gostivar: Lazaropolje, 1100 m, 1978. VI. 10., RI et RA - General distribution: European-Siberian species. Occurrence: wide-spread and frequent in Macedonia.

Platycerus Geoffroy, 1762

Platycerus caraboides (Linnaeus, 1758) - prov. Bitola: Mts. Baba, 1000 m, Govato, 1997. V. 2., RI - General distribution: European species. This is a new record for the scarabaeoid-fauna of the Macedonia.

Sinodendron Hellw.

Sinodendron cylindricum (Linnaeus, 1758) - prov. Berovo: Mts. Maleševski Pl., Palažlija-pass, 1140 m, 1998. VI. 5., RI - General distribution: European mountain species. Occurrence: frequent in the beech forests of Macedonia.

Trogidae

Trox Fabricius, 1775

Trox hispidus niger Rossi, 1792 - prov. Veles: 5 km SW of Viničani, 1997. V. 1-5., RG et RIB - General distribution: Euroasiatic subspecies. Occurrence: sporadic and frequent.

Geotrupidae

Geotrupes Latreille, 1796

Geotrupes spiniger Marsham, 1802 - prov. Skopje: Skopska Crna Gora, Mt. Dušanovac, 800 m, 1997. VII. 9., RG et RIB - General distribution: European-Anatolian species. Occurrence: wide-spread and frequent.

Anoplotrupes Jekel, 1865

Anoplotrupes stercorosus (Scriba, 1791) - prov. Gostivar: Mt. Bistra, 1700 m, 1998. V. 30., RI; prov. Berovo: Maleševski Pl., 800-1000 m, 1998. VI. 6., RI - General distribution: Northern- and Central-European species. Occurrence: wide-spread and common.

Thorectes Mulsant, 1842

Thorectes punctulatus Jekel, 1865 (= *Jekelius* (*Reitterius*) *punctulatus* (Jekel, 1865)) - prov. Skopje: Skopska Crna Gora, 500-600 m, Mon. Sv. Jovan, 1998. VI. 27., RI; Skopska Crna Gora, 1400-1600 m, 1998. V. 28., RI - General distribution: Balkan mountain and endemic species. Occurrence: sporadic and rare.

Trypocopris Motschulsky, 1858

Trypocopris vernalis vernalis (Linnaeus, 1758) - prov. Gostivar: Lazaropolje, 1100 m, 1978. VI. 10., RI et RA; prov. Skopje: Skopska Crna Gora, 500-600 m, Mon. Sv. Jovan, 1998. V. 27., 1998. VI. 8., RI; Skopska Crna Gora, 1400-1500 m, 1998. V. 28., RI - General distribution: European species. Occurrence: very wide-spread and common.

Trypocopris vernalis fulgidus Motschulsky, 1845 (*Trypocopris vernalis* (L.) nat. *bistrensis* Mikšić, 1954))- prov. Gostivar: Mt. Bistra, 1700 m, 1998. V. 30, RI - General distribution: endemic subspecies of Macedonia. It is found in the subalpine parts of the Bistra Mountains.

Lethrus Scopoli, 1777

Lethrus (Autolethrus) elephas Reitter, 1890 - prov. Prilep: Prilepska Pl., 600 m, Volkovo, 1997. V. 6., RI; Kruševo, 1998. V. 31., RI - General distribution: Balkan-Asianic species. Occurrence: sporadic and rare.

Lethrus (s.str.) apterus (Laxmann, 1770) - prov. Prilep: Prilepska Pl., 600 m, Volkovo, 1997. V. 6., RI; Kutleševo, 1998. V. 9., RI - General distribution: European species. This is a new record of Macedonia.

Ochodaeidae

Ochodaeus Serville, 1825

Ochodaeus chrysomeloides (Schrank, 1781) - vil. Tetovo: Suva Gora, 1000 m, Izvor, 1978. VI. 9., RI et RA - General distribution: European species. This is a new record of Macedonia.

Aphodiidae

Aphodius Illiger, 1798

Aphodius (Acanthobodilus) immundus Creutzer, 1799 - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI - General distribution: Holomediterranean species. Occurrence: wide-spread and frequent.

Aphodius (Acrossus) depressus (Kugelann, 1792) - prov. Prilep: Prilepska Pl., 600 m, Volkovo, 1997. V. 6., RI; prov. Tetovo: Šar Planina, Popova Šapka, 1600-1800 m, 1998. V. 29., RI - General distribution: Euroasiatic species. Occurrence: the montainous district of Macedonia wide-spread and common.

Aphodius (Acrossus) luridus (Fabricius, 1775) - prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA; prov. Gostivar: Mts. Bukovik, 800-1200 m, 1997. V. 2-3., RI; prov. Skopje: Mt. Vodno, 600 m, Sonje, 1997. IV. 29., RI; Skopska Crna Gora, 800-1200 m, Creševo, 1997. V. 4., RI; prov. Prilep: Prilepsko Pl., 600 m, Volkovo, 1997. V. 6., RI - General distribution: West-Palearctic species. Occurrence: wide-spread and frequent.

Aphodius (Amidorus) obscurus obscurus (Fabricius, 1792) - prov. Tetovo: Mts. Šar Planina, Popova Šapka, 1600-1800 m, 1998. V. 29., RI - General distribution: European-Anatolian mountainous species. Occurrence: wide-spread and frequent.

Aphodius (s.str.) fimetarius (Linnaeus, 1758) - prov. Resen: shore of lake Prespa, Otěsevo, 1978. VI. 7., RI; prov. Skopje: Skopska Crna Gora, Mt. Dušanovac, Mon. Sv. Ilia, 1997. IV. 29., RI; Mt. Vodno, 600 m, Sonje, 1997. IV. 29., RI - General distribution: Palearctic species. Occurrence: wide-spread and common.

Aphodius (s.str.) foetidus (Herbst, 1783) (= *scybalarius* Fabricius, 1792) - prov. Radoviš: Radoviš, 1976. VI. 28-29., RI et RA - General distribution: Circummediterranean species. The literature mentions (Mikšić, 1955) only from Northern-Macedonia. Occurrence: very rare.

Aphodius (Bodilus) ictericus (Laicharting, 1781) (= *nitidulus* Fabricius, 1792) - prov. Resen: Bogile, 1978. VI. 7., RI et RA; shore of lake Prespa, Oteševo, 1978. VI. 7., RI et RA - General distribution: European species. Occurrence: sporadic and not frequent.

Aphodius (Calamosternus) granarius (Linnaeus, 1767) - prov. Resen: Bogile, 1978. VI. 7., RI et RA; prov. Skopje: Skopje, 1981. V. 2., RI - General distribution: Cosmopolitan species. Occurence: very wide-spread and common.

Aphodius (Chilothorax) distinctus (Müller, 1776) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA - General distribution: European-Anatolian species. Occurrence: wide-spread and common.

Aphodius (Chilothorax) sticticus (Panzer, 1798) (= *equestris* Panzer, 1798) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA - General distribution: European-Anatolian species. Occurrence: wide-spread and common.

Aphodius (Colobopterus) erraticus (Linnaeus, 1758) - prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA; prov. Resen: shore of lake Prespa, Oteševo, 1978. VI. 7., RI et RA - General distribution: Palearctic species. Occurrence: very wide spread and common.

Aphodius (Coprimorphus) scrutator (Herbst, 1789) - prov. Resen: shore of lake Prespa, Oteševo, 1978. VI. 7., RI et RA; prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA; prov. Tetovo: Mts. Šar Planina, Mt. Popova Šapka, 1600-1800 m, 1997. VII. 11., RG et RIB - General distribution: Central- and South-European species, which occurs in the Asia Minor. Occurrence: sporadic and not frequent.

Aphodius (Esymus) merdarius (Fabricius, 1775) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA; prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA - General distribution: European-Turanian species. Occurrence: wide-spread and frequent.

Aphodius (Esymus) pusillus (Herbst, 1789) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA; prov. Tetovo: Mts. Šar Planina, Popova Šapka, 1600-1800 m, 1998. V. 29., RI - General distribution: Palearctic species. This is a new record of Macedonia.

Aphodius (Eudolus) quadriguttatus (Herbst, 1783) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA; prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA - General distribution: West-Palearctic species. This is a new record of Macedonia.

Aphodius (Eurodalus) coenosus (Panzer, 1798) (= *tristis* Zenker, 1801) - prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA; prov. Tetovo: Mts. Suva Gora, 1000 m, Izvor, 1968. VI. 9., RI - General distribution: European species. This is a new record of Macedonia.

Aphodius (Melinopterus) prodromus (Brahm, 1790) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA - General distribution: Palearctic species. Occurrence: very wide-spread and common.

Aphodius (Melinopterus) sphacelatus (Panzer, 1798) - prov. Tetovo: Mts. Šar Planina, Popova Šapka, 1600-1800 m, 1998. V. 29., RI - General distribution: Palearctic species. This is a new record of Macedonia.

Aphodius (Nialus) varians Duftschmid, 1805 - prov. Radoviš: Radoviš, 1976. VI. 28-29, RI - General distribution: Palearctic species. Occurrence: very wide-spread and frequent.

Aphodius (Otophorus) haemorrhoidalis (Linnaeus, 1758) - prov. Resen: shore of lake Prespa, Otěsevo, 1978. VI. 7., RI et RA - General distribution: European species. Occurrence: sporadic and not frequent.

Aphodius (Phalacronotus) biguttatus Germar, 1824 - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA - General distribution: European-Turanian species. This is a new record of Macedonia.

Scarabaeidae

Gymnopleurus Illiger, 1803

Gymnopleurus geoffroyi (Fuessly, 1775) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA; Mts. Dren, Dunje, 1997. V. 7., RI et RG; Prilepsko Pl., 600 m, Volkovo, 1997. V. 6., RI; prov. Skopje: Katlanovo, Vardar-valley, 1981. V. 2., 1982. V. 16., RI; D. Količan, Torbešija, 1997. IV. 20., RG et RIB; prov. Štip: Lakavica, 1982. V. 16., RI; prov. Strumica: Mts. Obesenik, Podazlija-pass, Hamzali, 1997. V. 8., RI; prov. Kavadarci: Faris, 1997. V. 1., RI - General distribution: European-Anatolian species. Occurrence: very wide-spread and frequent.

Gymnopleurus mopsus (Pallas, 1781) - prov. Skopje: Katlanovo, 1981. V. 2., RI; Torbešija, G. Količan, 1997. IV. 30., RI - General distribution: Palearctic species. Occurrence: wide-spread and common.

Scarabaeus Linnaeus, 1758

Scarabaeus (s.str.) pius (Illiger, 1803) - prov. Prilep: Mts. Dren, Dunje, 1997. V. 7., RI; prov. Veles: 5 km SW of Viničani, 1997. V. 1-5., RG et RIB - General distribution: Circummediterranean species. Occurrence: wide-spread and not frequent.

Scarabaeus (Ateuchetus) puncticollis (Latreille, 1819) - prov. Prilep: Prilepsko Pl., 600 m, Volkovo, 1997. V. 6., RI et RG; Mts. Dren, Dunje, 1997. V. 7., RG et RIB - General distribution: Circummediterranean species. Occurrence: This species is found mainly on the southern part of Macedonia, frequent.

Sisyphus Latreille, 1807

Sisyphus schaefferi (Linnaeus, 1758) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA; prov. Skopje: Katlanovo, Vardar-valley, 1981. V. 2., 1982. V. 16., RI; Torbešija, G. Količan, 1997. IV. 30., RI; Torbešija, D. Količan, 1997. IV. 30., RI; Skopska Crna Gora, Raštak, 1997. V. 4., RI - General distribution: Palearctic species. Occurrence: wide-spread and common.

Copris Müller, 1764

Copris lunaris (Linnaeus, 1758) - prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI; prov. Kumanovo: Tabanovce, 1995. V. 27., RI; prov. Strumica: Mts. Obešenik, Podazlija-pass, Hamzali, 1997. V. 8., RI; prov. Skopje: Skopska Crna Gora, Mt. Dušanovac, Skopje, 1997. VII. 9., GR et RIB; Skopska Crna Gora, 500-800 m, Mon. Sv. Jovan, 1998. V. 27., RI - General distribution: European-Siberian species. Occurrence: sporadic and frequent.

Euoniticellus Janssens, 1953

Euoniticellus fulvus (Goeze, 1777) - prov. Radoviš: Radoviš, 1976. VI. 28-29., RI; prov. Resen: shore of lake Prespa, 1978. VI. 7., RI; prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA; prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA - General distribution: West-Palearctic species. Occurrence: wide-spread and common.

Caccobius Thomson, 1859

Caccobius histeroides (Ménétriés, 1832) - prov. Strumica: Mts. Obešenik, Podazlija-pass, Hamzali, 1997. V. 8., RI - General distribution: East-Mediterranean species. Occurrence: sporadic and not frequent.

Caccobius schreberi (Linnaeus, 1767) - prov. Radoviš: Radoviš, 1976. VI. 28-29., RI; prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA; prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA; Prilepsko Pl., 600 m, Volkovo, 1997. V. 6., RI; Ropcovo, 1998. V. 31., RI; prov. Skopje: Katlanovo, 1981. V. 2., RI; Mt. Vodno, 600 m, Sonje, 1997. IV. 29., RI; Torbešija, G. Količan, 1997. IV. 30., RI - General distribution: West-Palearctic species. Occurrence: very wide-spread and common.

Euonthophagus Balthasar, 1959

Euonthophagus amyntas alces Fabricius, 1792 - prov. Skopje: Katlanovo, 1981. V. 2., RI; Skopska Crna Gora, Raštak, 1997. V. 4., RI; Skopska Crna Gora, Mt. Dušanovac, 800 m, 1997. V. 9., RI; Mt. Vodno, 600 m, Sonje, 1997. IV. 29., RI; prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 5-9., RI et RA; prov. Prilep: Prilepsko Pl., 600 m, Volkovo, 1997. V. 6., RI - General distribution: Central- and East-European subspecies. Occurrence: wide-spread and frequent.

Onthophagus Latreille, 1802

Onthophagus (Furconthophagus) furcatus (Fabricius, 1781) - prov. Prilep: Bogile, 1978. VI. 7., RI et RA; Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA; Prilepsko Pl., 600 m, Volkovo, 1997. V. 6., prov. Resen: shore of lake Prespa, Oteševo, 1978. VI. 7., RI et RA; prov.Vinica: He Kalimanci, 1982. VI. 3., RI; prov. Skopje: Mt. Vodno, 600 m, Sonje, 1997. IV. 29.; RI; Skopska Crna Gora, Mt. Dušanovac, 800m, 1997. V. 9., RI; Skopska Crna Gora, 800-1200 m, Creševo, 1997. V. 4., RI; Skopska Crna Gora, Raštak, 1997. V. 4., RI; prov. Strumica: Mt. Obešenik, Podazlija-pass, Hamzali, 1997. V. 8., RI; prov. Veles: 5 km NW of Viničani, 1997. V. 5., RI - General distribution: West-Palearctic species. Occurrence: very wide-spread and common.

Onthophagus (s.str.) illyricus (Scopoli, 1763) - prov. Skopje: Katlanovo, Vardar-valley, 1982. V. 16., RI - General distribution: Mediterranean species. Occurrence: wide-spread and frequent.

Onthophagus (s.str.) taurus (Schreber, 1799) - prov. Radoviš: Radoviš, 1976. Vi. 28-29., RI; prov. Resen: shore of lake Prespa, Oteševo, 1978. VI. 7., RI et RA; prov. Skopje: Katlanovo, 1981. V. 2., RI - General distribution: Palearctic species. Occurrence: wide-spread and frequent.

Onthophagus (Palaeonthophagus) grossepunctatus Reitter, 1905 - Suva Gora, 1000 m, Izvor, 1978. VI. 9., RI; prov. Radoviš: Radoviš, 1976. VI. 28-29., RI; prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA; prov. Prilep: Mts. Babuna, 1978. VI. 5-7., RI et RA., Prilepsko Pl., 600 m, Volkovo, 1997. V. 6., RI;

prov. Skopje: Katlanovo, Vardar-valley, 1981. V. 2., 1982. V. 16., RI; Mt. Vodno, 600 m, Sonje, 1997. IV. 29., RI; Skopska Crna Gora, Raštak, 1997. V. 4., RI - General distribution: European-Anatolian species. Occurrence: wide-spread and very frequent.

Onthophagus (Palaeonthophagus) ovatus (Linnaeus, 1767) - prov. Tetovo: Mts. Šar Planina, Mt. Popova Šapka, 1600-1800 m, 1998. V. 29., RI; prov. Gostivar: Mt. Bistra, 1700 m, 1998. V. 30., RI - General distribution: European-Anatolian species. Occurrence: sporadic and not frequent. This is a new record of Macedonia.

Onthophagus (Palaeonthophagus) panici Petrovitz, 1964 - prov. Tetovo: Mts. Šar Planina, Mt. Popova Šapka, 1600-1800 m, 1998. V. 29., RI; prov. Gostivar: Mt. Bistra, 1700 m, 1998. V. 30., RI - General distribution: Balkan endemic species. Occurrence: sporadic and rare. This is a new record of Macedonia.

Onthophagus (Palaeonthophagus) ruficapillus Brullé, 1832 - prov. Skopje: Katlanovo, 1981. V. 2., RI; Skopska Crna Gora, Mt. Dušanovac, 800 m, 1997. V. 9., RI; Mt. Vodno, 800 m, Sonje, 1997. IV. 29., RI; prov. Radoviš: Radoviš, 1976. VI. 28-29., RI; prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA; prov. Resen: Leva Reka, 1997. V. 2., RI; prov. Gostivar: Mts. Bukovik, 800-1200 m, 1997. V. 2-3., RI - General distribution: European-Anatolian species. Occurrence: wide-spread and common.

Onthophagus (Palaeonthophagus) fracticornis (Preyssler, 1790) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA; Prilepsko Pl., 600 m, Volkovo, 1997. V. 6., RI; prov. Skopje: Mt. Vodno, 600 m, Sonje, 1997. IV. 29., RI; Skopska Crna Gora, 1400-1500 m, 1998. V. 28., RI; Osoji near Matka, RAN; Prov. Tetovo: Mts. Šar Planina, Mt. Popova Šapka, 1600-1800 m, 1998. V. 29., RI; prov. Gostivar: Mt. Bistra, 1700 m, 1998. V. 30., RI - General distribution: European-Anatolian species. Occurrence: very wide-spread and common.

Onthophagus (Palaeonthophagus) lemur (Fabricius, 1781) - prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA; prov. Skopje: Katlanovo, Vardar-valley, 1982. V. 16., RI; Skopska Crna Gora, 800-1200 m, Creševo, 1997. V. 4., RI; Mt. Vodno, 600 m, Sonje, 1997. IV. 29., RI - General distribution: European species. Occurrence: wide-spread and frequent.

Onthophagus (Palaeonthophagus) marginalis Gebler, 1817 - prov. Prilep: Prilepsko Pl., 600 m, Volkovo, 1997. V. 6., RI; prov. Skopje: Skopska Crna Gora, Mt. Dušanovac, 800 m, 1997. V. 9., RI - General distribution: European-Siberian species. Occurrence: sporadic and not frequent.

Onthophagus (Palaeonthophagus) sericatus Reitter, 1893 - prov. Skopje: Katlanovo, 1981. V. 2., RI; Mt. Vodno, 600 m, Sonje, 1997. IV. 29., RI - General distribution: European-Anatolian species. This is a new record of Macedonia.

Onthophagus (Palaeonthophagus) similis (Scriba, 1790) - prov. Skopje: Skopska Crna Gora, 800-1200 m, Creševo, 1997. V. 4., RI - General distribution: Circummediterranean species. This is a new record of Macedonia.

Onthophagus (Palaeonthophagus) vacca (Linnaeus, 1767) - prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA; prov. Resen: Oteševo, shore of lake Prespa, 1978. VI. 7., RI et RA; prov. Kruševo: Mt. Crn Vrv, 1400 m, Kruševo, 1998. V. 31., RI - General distribution: Circummediterranean species. Occurrence: wide-spread and not frequent.

Onthophagus (Palaeonthophagus) verticicornis (Lasicharting, 1781) - Mts. Suva Gora, 1000 m, Izvor, 1978. VI. 9., RI et RA; prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA; prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA; prov. Skopje: Katlanovo, 1981. V. 2., RI et RG; Skopska Crna Gora, 800-1200 m, Creševo, 1997. V. 4., RI; Skopska Crna Gora, 1400-1500 m, 1998. V. 28., RI - General distribution: European-Turanian species. Occurrence: very wide-spread and common.

Glaphyridae

Eulasia Truqui, 1848

Eulasia (s.str.) arctos martes (Frivaldszky, 1845) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA; prov. Kavadarci: Debrište, 1998. V. 31., RI; prov. Kratovo: Žguri-pass, 880 m, 1998. VI. 6., RI - General distribution: Balcan endemic subspecies. Occurrence: wide-spread and frequent.

Eulasia (s.str.) bicolor bicolor (Waltl, 1838) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., 1982. VI. 4., RI et RA; prov. Skopje: Katlanovo, Vardar-valley, 1981. V. 2., 1982. V. 16., RI; prov. Radoviš: Radoviš, 1982. V. 17., RI - General distribution: Balkan-Anatolian subspecies. Occurrence: wide-spread and frequent.

Eulasia (s.str.) bicolor dichroa (Reitter, 1890) - prov. Skopje: Katlanovo, 1981. V. 2., RG et RIB; Katlanovo, Vardar-valley, 1982. V. 16., RI - General distribution: Balkan subspecies. Occurrence: wide-spread and frequent.

Eulasia (s.str.) bombyliformis athenae (Petrovitz, 1980) - prov. Skopje: Katlanovo, 1981. V. 2., RI - General distribution: Balkan subspecies. Occurrence: sporadic and very rare.

Eulasia (Vittateulasia) pareyssei (Brullé, 1832) (= *lasserrei* Germar, 1834) - Mts. Suva Gora, Izvor, 1978. VI. 9., RI et RA; prov. Kruševo: Kruševo, 1998. V. 31., RI; prov. Bitola: Kažani, 1998. VI. 5., RI - General distribution: European-Anatolian species. Occurrence: sporadic and frequent.

Pygopleurus Motschulsky, 1859

Pygopleurus apicalis (Brullé, 1832) - prov. Radoviš: Radoviš, 1982. V. 17., RI; prov. Skopje: Skopska Crna Gora, 500-600 m, Mon. Sv. Jovan, 1998. V. 27., RI; prov. Mak. Brod: Treska-valley, 4 km N of Devič, 1998. VI. 3., RI - General distribution: Balkan species. Baraud (1992) mention of existence from Macedonia, where the species is sporadic and not frequent.

Pygopleurus diffusus (Petrovitz, 1957) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., 1982. VI. 4., RI; prov. Radoviš: Radoviš, 1982. V. 17., RI; prov. Skopje: Katlanovo, Vardar-valley, 1982. V. 16., RI; Skopska Crna Gora, 500-600 m, Mon. Sv. Jovan, 1998. V. 27., RI - General distribution: Balkan-Anatolian species. Occurrence: wide-spread and frequent.

Pygopleurus humeralis (Brullé, 1832) - prov. Skopje: Mts. Ivanje, 900 m, Matka, 1998. VI. 1., RI; prov. Veles: 5 km NW of Viničani, 1997. V. 5., RI et RG; prov. Kruševo: Mt. Crn Vrv, 1400 m, Kruševo, 1998. V. 31., RI; prov. Ohrid: Pesočani, 1998. VI. 3-4., RI - General distribution: Balkan-Anatolian species. Occurrence: wide-spread and frequent.

Pygopleurus vulpes (Fabricius, 1781) - prov. Veles: 5 km NW of Viničani, 1987. V. 5., RI et RG - General distribution: European-Anatolian species. Occurrence: very wide-spread and common.

Melolonthidae

Anoxia Castelnau, 1832

Anoxia (Protanoxia) orientalis (Krynicky, 1832) - prov. Prilep: Prilep, 1972. VII. 4-10., PA - General distribution: Pontomediterranean species. Occurrence: wide-spread and frequent.

Amphimallon Le Peletier et Serville, 1825

Amphimallon assimile (Herbst, 1790) - prov. Tetovo: Mts. Šar Planina, Popova Šapka, 1900 m, 1997. VII. 12., RG - General distribution: West- and Central-European species. This is a new rare scarabaeoid species of Macedonia.

Amphimallon ochraceum (Knoch, 1801) - prov. Kruševo: Crn Vrv, Kruševo, 1997. VII. 13., RG - General distribution: West- and South-European species. This is a new rare scarabaeoid species of Macedonia.

Haplidia Hope, 1837

Haplidia transversa transversa (Fabricius, 1801) - prov. Skopje: Skopje, Matka, 300 m, Mon. Sveti Nikola, 1997. VII. 7., RG et RIB; Skopska Crna Gora, Mt. Dušanovac, 800 m, 1997. VII. 9., RG et RIB - General distribution: Balkan endemic subspecies. Occurrence: very wide-spread and frequent.

Holochelus Reitter, 1889

Holochelus costulatus (Frivaldszky, 1835) - prov. Skopje: Skopska Crna Gora, 1400-1500 m, 1998. V. 26., RI - General distribution: Balkan-Anatolian species. This species had a one previous literary data (Vodno) from Macedonia. This is a second locality of occurrence of his rare species.

Miltotrogus Reitter, 1902

Miltotrogus vernus (Germar, 1823) - prov. Resen: Mts. Baba, Makazi, 1981. V. 22., RG - General distribution: Pontic species. Occurrence: sporadic and not frequent.

Pseudotrematodes Jacquelin du Val, 1860

Pseudotrematodes frivaldszkyi (Ménétriés, 1836) - prov. Prilep: Kutleševo, 1998. V. 9., RI; Mt. Prilepsko Pl., 400 m, Volkovo, 1997. V. 6., RG et RIB; prov. Veles: 5 km SW of Viničani, 1997. V. 1-5., RG et RIB - General distribution: Balkan endemic species. Occurrence: wide-spread and not rare.

Rhizotrogus Berthold, 1827

Rhizotrogus aestivus (Olivier, 1789) - prov. Ohrid: Pesočani, 1998. VI. 3-4., RI - General distribution: European-Anatolian species. Occurrence: wide-spread and not rare.

Homaloplia Stephens, 1830

Homaloplia (s.str.) erythroptera Frivaldszky, 1835 - prov. Delčevo: Delčevo, 1982. VI. 3., RI - General distribution: Central- and East-European species. Occurrence: sporadic and not frequent.

Homaloplia (s.str.) graeca Reitter, 1887 - prov. Skopje: Mts. Skopska Crna Gora, Mt. Ranino, 1000-1500 m, 1997. VII. 9., RG - General distribution: Balkan species. Occurrence: rare.

Homaloplia (s.str.) illyrica Baraud, 1965 - Bogile, 1978. VI. 7., RI; prov. Tetovo: Mts. Šar Planina, Popova Šapka, 2000-2200 m, 1997. VII. 11., RI; 1900 m, 1997. VII. 11., RG; prov. Skopje: Mts. Skopska Crna Gora, Mt. Ranino, 1000-1500 m, 1997. VII. 9., RG - General distribution: Balkan species. Mikšić (1970) and Baraud (1992) mentioned from Macedonia. Occurrence: rare.

Hoplia Illiger, 1803

Hoplia (s.str.) argentea (Poda, 1761) - prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA; prov. Delčevo: Delčevo, 1982. VI. 3., RI; prov. Berovo: Mts. Maleševski Pl., Palažlija-pass, 1140 m, 1998. VI. 5., RI; prov. Skopje: Mt. Ivanje, 900 m, Matka, 1998. VI. 1., RI - General distribution: Balkan species. Occurrence: very wide-spread and frequent.

Rutelidae

Anisoplia Fischer, 1824

Anisoplia (s.str.) bureschi Zacharieva-Stoilova, 1958 - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA - General distribution: Balkan species. Mikšić (1970) considered to the subspecies of Anisoplia flavipennis Brullé, 1832, Baraud (1992) wrote to an independent species. Occurrence: sporadic and not frequent.

Anisoplia (s.str.) lata lata Erichson, 1847 - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., 1982. VI. 4., RI et RA - General disribution: Balkan subspecies. Mikšić (1970) considered to the subspecies of Anisoplia flavipennis Brullé, 1832, Baraud (1992) described it as an independent species. Occurrence: wide-spread and frequent.

Anisoplia (s.str.) agricola (Poda, 1761) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA; Bogile, 1978. VI. 7., RI et RA; prov. Kavadarči: Debrište, 1998. V. 31., RI - General distribution: European-Siberian species. Occurrence: wide-spread and frequent.

Anomala Samouelle, 1819

Anomala (s.str.) solida Erichson, 1847 - prov. Prilep: Prilep, 1971. VII. 10-18., PA; prov. Radoviš: Radoviš, 1976. VI. 28-29., RI; prov. Delčevo: Delčevo, 1976. VII. 15., RI - General distribution: Balkan-Anatolian species. Occurrence: sporadic and rare.

Blitopertha Reitter, 1903

Blitopertha lineolata Fischer, 1823 - prov Delčevo: Delčevo, 1982. VI. 3., RI; prov. Vinica: He Kalimanci, 1982. VI. 3., RI; prov. Kratovo: Trnovac, 1998. VI. 7., RI; Žguri-pass, 880 m, 1998. VI. 6., RI; prov. Prilep: Mažučiste, 1998. V. 31., RI; prov. Ohrid: Pesočani, Bank of Sateskar, 1978. VI. 9., RI et RA; Pesočani, 1998. VI. 3-4., RI - General distribution: East-Mediterranean species. Occurrence: wide-spread and common.

Chaetopteroplia Medvedev, 1949

Chaetopteroplia segetum segetum (Herbst, 1781) - prov. Mak. Brod: Mt. Drobaci, Treska-valley, 1998. VI. 2-3., RI; prov. Prilep: Mts. Babuna, Rakle, 1982. VI. 4., RI - General distribution: European species. Occurrence: very wide-spread and frequent.

Chetopteroplia segetum balcanicola Machatschke, 1961 - prov. Mak. Brod: Mt. Drobaci, Treska-valley, 1998. VI. 2-3., RI; prov. Prilep: Bogile, 1978. VI. 7., RI et RA - General distribution: Balkan endemic subspecies. Occurrence: sporadic and not rare

Dynastidae

Oryctes Illiger, 1798

Oryctes (s.str.) nasicornis kuntzeni Minck, 1914 - prov. Radoviš: Radoviš, 1976. VI. 28-29., RI; prov. Delčevo: Delčevo, 1976. VII. 15., RI - General distribution: Balkan-Anatolian subspecies. Occurrence: sporadic, and rare.

Pentodon Hope, 1837

Pentodon idiota (Herbst, 1789) - prov. Veles: 5 km NW of Viničani, 1997. V. 5., RI - General distribution: East-Mediterranian species. Occurrence: wide-spread and not frequent.

Cetoniidae

Valgus Scriba, 1790

Valgus hemipterus Linnaeus, 1758 - Mts. Suva Gora, Izvor, 1000 m, 1978. VI. 9., RI et RA; prov. Prilep: Mts. Babuna, Rakle, 1982. VI. 4., RI; prov. Radoviš: Radoviš, 1982. V. 17., RI; prov. Berovo: Mts. Maleševski Pl., 800-1000 m, 1998. VI. 6., RI; prov. Skopje: Mt. Ivanje, 800 m, Matka, 1998. VI. 1., RI; prov. Prilep: Ropcovo, 1998. V. 31., RI - General distribution: West-Palearctic species. Occurrence: very wide-spread and common.

Gnorimus Serville, 1825

Gnorimus nobilis (Linnaeus, 1758) - prov. Skopje: Skopska Crna Gora, Mt. Dušanovac, 800 m, 1997. VII. 9., RG et RIB; Skopska Crna Gora, Mt. Ranino, 1000-1500 m, 1997. VII. 9., RG et RIB - General distribution: European-Anatolian species. Occurrence: wide spread, but not frequent.

Trichius Fabricius, 1775

Trichius fasciatus (Linnaeus, 1758) - prov. Skopje: Skopska Crna Gora, Mt. Dušanovac, 800 m, 1997. VII. 9., RG et RIB; Skopska Crna Gora, Mt. Ranino, 1000-1500 m, 1997. VII. 9., RG et RIB - General distribution: European-Siberian species. Occurrence: on the mountainous district is sporadic, not frequent.

Trichius sexualis Bedel, 1906 - prov. Prilep: Mts. Babuna, Rakle, 1982. VI. 4., RI; prov. Vinica: He Kalimanci, 1982. VI. 3., RI; prov. Skopje: Skopska Crna Gora, Mt. Dušanovac, 800 m, 1997. VII. 9., RG et RIB - General distribution: European species. Occurrence: wide-spread, but not frequent.

Cetonia Fabricius, 1775

Cetonia aurata (Linnaeus, 1761) - prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA; prov. Bitola: Mts. Baba, 700 m, Magarevo, Pelister-camp, 1978. VI. 7., RI et RA; prov. Delčevo: Delčevo, 1982. VI. 3., RI; prov. Strumica: Udovo, Vardar-valley, 1996. VI. 11., RI; prov. Mak. Brod: Mt. Drobaci, Treska-valley, 1998. V. 2-3., RI; prov. Kruševo: Mt. Crn Vrv, 1400 m, Kruševo, 1998. V. 31., RI; prov. Skopje: Mt. Ivanje, 800 m, Matka, 1998. VI. 1., RI; Skopska Crna Gora, Mt. Dušanovac, 800 m, 1997. V. 9., RI; Skposka Crna Gora, 500-600 m, Mon. Sv. Jovan, 1998. V. 27., RI; Skopska Crna Gora, Mt. Ranino, 1000-1500 m, 1997. VII. 9., RG et RIB; prov. Gostivar: Mts. Bukovik, 1000-1200 m, 1997. V. 2-3., RI - General distribution: European species. Occurrence: very wide-spread and very common.

Netocia Costa, 1852

Netocia (s.str.) hungarica (Herbst, 1790) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA; prov. Kavadarci: Debrište, 1998. V. 31., RI - General distribution: Pontic species. Occurrence: wide-spread and frequent.

*Netocia (Potosia) angustata (*Germar, 1817) - prov. Strumica: Udovo, Vardar-valley, 1996. VII. 11., RI -General distribution: East-Mediterranean species. Occurrence: wide-spread and frequent.

Netocia (Potosia) cuprea obscura (Andersch, 1797) - prov. Delčevo: Delčevo, 1976. VII. 15., RI, 1982. VI. 3., RI; prov. Ohrid: Mts. Galičica, Ljubanište, 1978. VI. 8-9., RI et RA - General distribution: Balkan subspecies. Occurrence: wide-spread and frequent.

Tropinota Mulsant, 1842

*Tropinota hirta (*Poda, 1761) - prov. Radoviš: Radoviš, 1976. VI. 28-29., RI; prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA, 1982. VI. 4., RI; prov. Ohrid: Pesočani, bank of Sateskar, 1978. VI. 9., RI et RA; prov. Skopje: Katlanovo, Vardar-valley, 1982. V. 16., RI; prov. Delčevo: Delčevo, 1982. VI. 3., RI - General distribution: Circummediterranean species. Occurrence: wide-spread and common.

Tropinota hirta suturalis Reitter, 1913 - prov. Veles: 5 km NW of Viničani, 1997. V. 5., RI; prov. Resen: Leva Reka, 1997. V. 2., RI; prov. Skopje: Torbešija, D. Količan, 1997. IV. 30., RI; Skopska Crna Gora, Mt. Dušanovac, 800 m, 1997. V. 9., RI; Mt. Ivanje, 900 m, Matka, 1998. VI. 1., RI; prov. Kavadarci: Debrište, 1998. V. 31., RI - General distribution: Pontomediterranean subspecies. Occurrence: very wide-spread and common.

Oxythyrea Mulsant, 1842

Oxythyrea albopicta (Motschulsky, 1854) - prov. Veles: 5 km NW of Viničani, 1997. V. 5., RI; prov. Štip: Mts. Konecka Pl., 600 m, Leskovica, 1997. V. 7., RI - General distribution: Pontomediterranean species. It is known only from Macedonia in the Balkans, very rare.

Oxythyrea cinctella (Schaum, 1841) - prov. Prilep: Mts. Babuna, Rakle, 1978. VI. 5-7., RI et RA, 1982. VI. 4., RI; prov. Štip: Lakavica, 1982. V. 16., RI; prov. Strumica: Udovo, Vardar-valley, 1996. VII. 11., RI; prov. Valandovo: Dedeli, 1998. VI. 5., RI; prov. Kavadarci: Debrište, 1998. V. 31., RI - General distribution: East-Mediterranean species. Occurrence: wide-spread, but not common.

Oxythyrea funesta (Poda, 1761) - prov. Prilep: Mts. Babuna, Rakle, 1982. VI. 4., RI; prov. Delčevo: Delčevo, 1982. VI. 3., RI; prov. Štip: Lakavica, 1982. V. 16., RI; prov. Strumica: Udovo, Vardar-valley, 1996. VII. 11., RI - General distribution: Mediterranean species. Occurrence: wide-spread and very frequent.

Genus	**Number of Spcecies**	
Lucanidae	3	3
Geotrupidae	5	7
Ochodaeidae	1	1
Aphodiidae	1	21
Scarabaeidae	8	24
Glaphyridae	2	9
Melolonthidae	9	12
Rutelidae	4	7
Dynastidae	2	2
Cetoniidae	7	13
Altogether:	**42**	**99**

Summary

Between 1976 and 1998 researchers of the Hungarian Entomological Society collected 10 families of Lamellicornia, 42 genera, 99 species in the Republic of Macedonia (formerly Yugoslav Macedonia). The collected material is classified as such:

The records of 15 species are new as previously published Macedonian records of these don't exist. The newly recorded species are:

Platycerus caraboides (Linnaeus, 1758)
Lethrus apterus (Laxmann, 1770)
Lethrus elephas Reitter, 1890
Ochodaeus chrysomeloides (Schrank, 1781)
Aphodius pusillus (Herbst, 1789)
Aphodius quadriguttatus (Herbst, 1783)
Aphodius coenosus (Panzer, 1789)
Aphodius sphacelatus (Panzer, 1798)
Aphodius biguttatus Germar, 1824

Onthophagus ovatus (Linnaeus, 1767)
Onthophagus panici Petrovitz, 1964
Onthophagus sericatus Reitter, 1893
Onthophagus similis (Scriba, 1790)
Amphimallon assimile (Herbst, 1790)
Amphimallon ochraceum (Knoch, 1801)

The further research of the Macedonian Lamellicornia fauna may reveal more novelties regarding the distribution of species known from surrounding territories.

Acknowledgement

We are indebted to Denis Keith (France) and László Ádám (Hungary) for their assistance in determination, to Antal Rozner (Hungary) for his help int he organisation of the 1997 and 1998 collecting trips and to György Hangay (Australia) for the translation of the original manuscript of this article.

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DOI:10.24394/NatSom.2009.15.69 | Natura Somogyiensis | 15 | 69-100 | Kaposvár, 2009

Additional Data to the Lamellicornia Fauna of Turkey (Coleoptera: Lamellicornia)

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Rozner I., Rozner Gy.: *Additional Data to the Lamellicornia Fauna of Turkey (Coleoptera: Lamellicornia).*
Abstract: Between 1977 and 2006 researchers of the Hungarian Entomological Society conducted 9 collecting trips to Turkey. In this paper the authors provide a list of the Lamellicornia species with collecting data, collected on these trips. 12 families, 64 genera, 270 species and subspecies are listed. The records of 20 species are new as previous published records of these don't exist. The newly recorded species are: *Aphodius gagatinus* Mén., *A. planicollis* (Reitt.), *A. equinus* (Fald.), *A. pustulifer* Reitt., *A. abchasicus* Reitt., *A. citellorum* Sem. et Medv., *A. nanoides* (Balth.), *A. lucidus* Klug, *Oxyomus silvestris* (Scop.), *Pleurophorus apicipennis* Reitt., *Rhyssemus algiricus meridionalis* Reitt., *Bubas bison* (L.), *Onthophagus similis* (Scriba), *Onthophagus tesquorum* Sem. et Medv., *Eulasia arctos arctos* (Pall.), *Eulasia korbi* (Petr.), *Homaloplia ruricola* (Fabr.), *Hoplia caucasica* Kol., *Hoplia cylindrica* Reitt., *Hoplia pollinosa* Kryn.

Keywords: faunistics, biodiversity, beetle, Turkey

Introduction

Since 1970 Hungarian entomologists, benefiting from a newly introduced passport policy, organised several collecting trips to the countries of the Balcan and to Asia Minor. In 1988 the introduction of the so-called "World Passport" in Hungary made further travels possible. Entomologists of the Hungarian Entomological Society brought home large collections of insects from abroad for the Hungarian Natural History Museum, several other museums and for private collections.

Overwiev of the collecting expeditions conducted by Hungarian entomologists in Turkey

Hungarian entomological research in Turkey already started in the first third of the 19th century. Imre Frivaldszky (1799-1876) was the first notable entomologist, who between 1833 and 1845 conducted zoological expeditions there. In 1846 he undertook another collecting expedition to Asia-Minor, with his nefew and understudy János Frivaldszky (1822-1895). In 1870 he worked in Smyrna (Izmir), Bursa and int he Olympus Mountains (Ulu Dağ) with his preparator János Pável, who was also an excellent lepidopterist.

In 1844 János Frivaldszky travelled to Crete, where he stayed for 10 months, collecting insects. From Crete he sailed to Asia-Minor where he continued his entomological

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

work, once again in Smyrna, Bursa and int he Olympus Mountains. He returned to Hungary in 1845.

Among the other well-known and important Hungarian zoologists Lajos Bíró (1856-1931) should be mentioned, who in 1925 undertook a collecting jouney to Turkey.

During the recent decades, with the improved conditions for private motorists, entomological research in Turkey and Asia-Minor gained a new impetus. It became possible to undertake larger collecting trips and travel longer distances.

Coleopterological collecting conducted in recent years:

1977: western and southern Asia-Minor, Attila Podlussány, Mrs Judit Podlussány and Lajos Podlussány.
1984: István Rozner, Mrs. Auguszta Rozner, Dezső Szalóki and Dr. Sándor Tóth collected in West and Central Anatolia, in Cappadocia and int he Taurus Mountains.
1987: István Rozner, Mrs Auguszta Rozner collected in West and Central Anatolia and in the Pontus-Taurus Mountains.
1989: Attila Podlussány, Mrs. Judit Podlussány, István Rozner, Mrs. Auguszta Rozner collected in Central and East Anatolia, in the Ararat Mountains (Ağri Dağı) and the valley of the River Aras.
1990: The researchers of the Hungarian Entomological Society: József Muskovits, András Orosz, Attila Podlussány. Dezső Szalóki, Kálmán Székely and Gergő Várkonyi circled Lake Van and collected Anatolia-wide.
1996: Attila Podlussány, István Rozner and Dezső Szalóki, undertook a three weeks long collecting trip during which they have visited the northwest regions of Asia-Minor, the Lower Caucasian Mountains and the Pontus-Taurus Mountains.
2001: György Rozner and Mrs. Ibolya Rozner collected in West-Anatolia.
Smaller collections were also made when the collectors' focus shifted to Iran and Syria. Traveling by motorcar to these destinations, collections were made in Turkey while in transit:
2000: György Fábián, Kálmán Gaskó, György Rozner, Lajos Szécsényi, Kálmán Székely collected ont he way to Iran.
2004 and 2006: László Nádai, Nikola Rahme, György Rozner, Mrs. Ibolya Rozner, Kálmán Székely collected on the way to Syria.

Method of determining and recording the scarabaeoid material collected in Turkey

The collected material was processed by István Rozner and György Rozner. This article contains the data of the Lamellicornia material obtained in 9 collecting expedition. The list of species is composed after Baraud (1992). Distribution and level of occurence of the species are based on published records and on our own experiences.

The list of taxa contains 12 families, 64 genera and 270 species and subspecies.

Data and abbreviations of the species list

The data is shown int he list of species in the following manner: family and genus names in the **bold** and ***bold italics***, species in the *italics* synonyms as shown in Hungarian literature in the *italics* with brakets, names of food plants also with italics and districts with regular letters, collecting localities and related data such as altitude, time of collecting and the names collectors abbreviated. Notes regarding the species are marked with the - sign.

Abbreviations:
Mt, Mts. = hegy, hegység, Dağ, Dağlari, mount, mountains; **v.** = völgy, valley; **prov.** = megye, vilayet, county; **TN** = tápnövény, food plant

Abbreviations of the collectors' names (surnames first):
ÁL = Ábrahám Levente; GK = Gaskó Kálmán; HB = Herczig Béla; OA = Orosz András; PA =Podlussány Attila; RA = Rozner Istvánné; RIB =Rozner Ibolya; RG =Rozner György; RI =Rozner István; RN = Rahme Nikola; ROG = Ronkay Gábor; SC =Szabóky Csaba; SZD = Szalóki Dezső; SZK =Székely Kálmán; TS =Tóth Sándor

List of species and collecting data

Lucanidae

Dorcus MacLeay, 1819

Dorcus parallelepipedus (Linnaeus, 1758) - prov. Artvin: Cakurtaran-pass, 800 m, 1996. VII. 1-2., RI; prov. Isparta: 15 km of Sütcüler, Sipahiler, 2001. V. 23., RG et RIB - General distribution: European-Siberian species. Occurrence: sporadic and rare.

Trogidae

Trox Fabricius, 1775

Trox hispidus (Pontoppidan, 1763) - prov. Sivas: Gürün, 1500 m, 1990. V. 28-29., SC - General distribution: Euroasiatic species. Occurrence: sporadic and not frequens.

Trox scaber (Linnaeus, 1767) (= *Trox barbosus* Laicharting, 1781) - prov. Erzurum: Aksu, 1650 m, 1996. VI. 28., at light, SZD - General distribution: Palearctic species. Occurrence: sporadic and very rare.

Geotrupidae

Typhoeus Leach, 1815

Typhoeus fossor Waltl, 1838 - prov. Eskişehir: Karaagac Köyü, 1989. VI. 12., RI; prov. Izmir: Bergama, 1990. IV. 24., PA; prov. Edirne: 20 km SE of Edirne, 109 m, 2006. IV. 16., RG et RIB; prov. Antalya: Güney, 1984. V. 10., SZD; prov. Adana: Kabasakal, 1990. IV. 3., SZD; prov. Adiyaman: Cendere Köprü, 1990. IV. 6., SZD; Narince, 1990. IV. 7., SZD - General distribution: East-Mediterranean species. Occurrence: sporadic and not frequens.

Geotrupes Latreille, 1796

Geotrupes (s.str.) mutator Marsham, 1802 - prov. Nevşehir: Kappadokia, Göreme, 1984. V. 16-17., RI, RA et SZD; prov. Gümüşhane: Mts. Gümüşhane, 1600 m, Alucra, 1987. V. 19., RI - General distribution: European species, which occurs in the Caucasus Mountains. Occurrence: sporadic and rare.

Geotrupes (s.str.) spiniger (Marsham, 1802) - prov. Erzincan: Ganiefendi Çiflik Köyü, 1200 m, 1996. VI. 27., SZD - General distribution: West-Palearctic species. Occurrence: sporadic and not frequent.

Geotrupes (s.str.) stercorarius (Linnaeus, 1758) - prov. Erzincan: Mts. Keşiş, Derekorosu, 1989. VI. 7., RI; prov. Rize: Ovitdağı, 2600 m, 1996. VII. 3-4., RI - General distribution: European species. Occurrence: wide-spread and frequent.

Glyptogeotrupes Nikolajev, 1979

Glyptogeotrupes molestus (Faldermann, 1835) - prov. Rize: Ovitdağı, 2600 m, 1996. VII. 3-4., RI et SZD - General distribution: Caucasian species. This is very rare in Turkey.

Thorectes Mulsant, 1842

Thorectes (s.str.) brullei anatolicus Jekel, 1865 - prov. Çanakkale: Ezine, 1984. V. 2., SZD; prov. Izmir: Bergama (Pergamon), 1984. V. 3., RI et RA - General distribution: Mediterranean species. This subspecies occurs in Anatolia, not frequent.

Lethrus Scopoli, 1777

Lethrus (s.str.) brachiicollis Fairmaire, 1855 - prov. Kesan: Hamidiye, 1984. V. 1., RI - General distribution: Balkan-Anatolian species. Occurrence: sporadic, rare.

Lethrus (s.str.) fallax Nilolajev, 1975 - prov. Edirne: Koru Dağ, 1989. V. 22., RI - General distribution: Balkan-Asianic species. Occurrence: sporadic and rare.

Hybosoridae

Hybosorus Macleay, 1819

Hybosorus illigeri Reiche, 1853 - prov. Içel, Mersin, 1984. V. 12., SZD - General distribution: Mediterranean species. Occurrence: sporadic and not frequent.

Seleucosorus Kuijten, 1983

Seleucosorus punctatissimus (Reiche, 1861) (=*Hybosorus punctatissimus* Reiche, 1861) - prov. Muğla: 5 km NW of Kargi, Katranci, 2001. V. 18-20., RG et RIB - General distribution: Anatolian species, which also occurs in Syria.

Ochodaeidae

Ochodaeus Serville, 1825

Ochodaeus cornifrons Solsky, 1876 - prov. Içel: Anamuryum, 1984. V. 11., SZD - General distribution: European-Turanian species: Occurrence: wide-spread, but is rare.

Ochodaeus integriceps Semenov, 1891 - prov. Içel: Mts. Taurus, Çamlyayla, soil traps, 1984. V. 15., RI; Narlikuyu, 1984. V. 12., SZD; prov. Isparta: 15 km of Sütcüler, Sipahiler, 2001. V. 23., RG et RIB; prov. Antalya: 10 km N of Manavgat, Bucakseyhler, 2001. V. 22., RG et RIB; prov. Muğla: 5 km NW of Kargi, Katranci, 2001. V. 18-20., RG et RIB; Karabögürtlen, 2001. V. 17., RG et RIB - General distribution: Caucasian species. Occurrence: wide-spread, but is rare.

Ochodaeus thalycroides Reitter, 1893 - prov. Edirne: 4 km N of Kesan, 2001. V. 12., RG et RIB - General distribution: Balkan species. It is in the European Turkey sporadic and rare.

Aphodiidae

Aphodius Illiger, 1798

Aphodius (Acanthobodilus) immundus Creutzer, 1799 - prov. Içel: Mts. Taurus, Kerimler, 1984. V. 13., RI; Mts. Taurus, 1600 m, Çamlyayla, 1984. V. 15., RI et RA; Mts. Taurus, Yavca, 1984. V. 13., SZD; prov. Sakarya: Düzce, 1984. V. 20., RI et RA; prov. Burdur: Dinar, 1984. V. 6., RI et RA; prov. Ankara: Pazar, shore of lake, 1984. V. 19., RI et SZD; Yassihöyük, 1987. V. 27., RI; Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI; Keskin, 1984. V. 18., SZD; prov. Samsun: Mahmutlu, 700 m, 1996. VII. 8., RI et SZD; prov. Çorlu: Marmaracik, 1987. VI. 3., RI; vi. Erzincan: 5 km E of Erzincan, 1996. VI. 27., RI; Ganiefendi Çiflik Köyü, 1200 m, 1996. VI. 27., at light, SZD; prov. Antalya: Antalya, 1984. V. 7., SZD; - General distribution: Palearctic species. Occurrence: wide-spread and common.

Aphodius (Acrossus) depressus (Kugelann, 1792) - prov. Sakarya: Esme, 1987. V. 11., RI et RA; prov. Çorum: Alaçahöyük, 1987. V. 15., RI et RA; prov. Artvin: Cankurtaran-pass, 800 m, 1996. VII. 1-2., RI - General distribution: Euroasiatic species. Occurence: wide-spread and frequent.

Aphodius (Acrossus) gagatinus Ménétriés, 1832 - prov. Ardahan: Yalnizcam, 2500 m, 1996. VI. 30., RI - General distribution: Caucasian-Turanian species. This is a new record for Turkey.

Aphodius (Acrossus) luridus (Fabricius, 1775) - prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI; prov. Izmir: Bergama, (Pergamon), 1984. V. 3., RI; prov. Burdur: Dinar, 1984. V. 6., RI et SZD; prov. Içel: Mts. Taurus, Kerimler, 1984. V. 13., RI; Mts. Taurus, Çamlyayla, 1984. V. 15., RI et SZD; Mts. Taurus, Yavca, 1984. V. 13., RI et SZD; prov. Çorlu: Marmaracik, 1987. VI. 3., RI et RA; Lüleburgaz, 1987. V. 11., RI et RA; prov. Eskişehir: Yazilikaya, 1987. V. 29., RI et RA; Sükrauli Köyü, 1987. V. 29., RI et RA; Çukurca Köyü, 1987. V. 29., RI; prov. Çorum: Sekerhacili, 1987. V. 15., RI et RA; prov. Ankara: Pazar, 1984. V. 19., SZD; Pazar, 1987. V. 12., RI et RA; Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI; Akyarma-pass, 1500 m, bank of Aktas-river, 1987. V. 12., RI et RA; 50 km S of Ankara, 1094 m, 2006. IV 17., RG et RIB; prov. Gümüşhane: Mts. Gümüşhane, 1600 m, Alucra, 1987. V. 19., RI et RA; Telme, 1987. V. 20., RI et RA; prov. Sivas: Kizilli, 1987. V. 24., RI; 13 km E of Zara, 1987. V. 23., RI et RA; Kizil Dağ, 1900 m, 1987. V. 23., RI; Ortagöze, 1987. V. 23., RI et RA; prov. Erzurum: Egerti, 1987. V. 22., RI et RA; Askale, 1987. V. 22., RI et RA; Horasan, 1990. IV. 13., SZD; Erzurum, 1990. IV. 13., SZD; prov. Kars: Mts. Ararat, 1989. VI. 4., RI; prov. Ağri: Meydandağı,

1989. VI. 3., RI; Sarican, 1990. IV. 12., SZD; prov. Tarsus: Gülek, 808 m, 2006. IV 17., RG et RIB; prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB; Çalislar, 2001. V. 25., RG et RIB; Ayazini, 1990. IV. 18., SZD; prov. Adiyaman: Narince, 1990. IV. 7., SZD; Nemrut Dağı, 1990. IV. 6., SZD; Kâhta, Karakus, 1990. IV. 6., SZD; prov. Diyarbakir: Alipaşa, 1990. IV. 9., SZD; prov. Bitlis: Küçüksu, 1990. IV. 10., SZD; prov. Gaziantep: Gaziantep, 1990. IV. 5., SZD; prov. Siirt: Silvan, 1990. IV. 9., SZD - General distribution: Palearctic species. Occurrence: wide-spread and common.

Aphodius (Acrossus) planicollis (Reitter, 1890) - prov. Artvin: Yalnizçam pass, 2000 m, 1996. VII. 1., SZD - General distribution: Caucasian species. This is a new record for Turkey.

Aphodius (Acrossus) rufipes (Linnaeus, 1758) - prov. Artvin: Çankurtaran-pass, 860 m, 1996. VII. 1-2., RI - General distribution: Holarctic species. Occurrence: wide-spread and not frequent.

Aphodius (Agrilinus) ater (De Geer, 1774) - prov. Artvin: Çankurtaran-pass, 800 m, 1996. VII. 1-2., RI - General distribution: Palearctic species. Occurrence: sporadic, not frequent.

Aphodius (Alocoderus) lineimargo Reitter, 1892 (= *turbatus* Baudi, 1870) - prov. Van: Kiziltaş, 1989. VI. 2., RI; prov. Afyon: 15 km NE of Afyon, Atlihisar, 2001. V. 24., RG et RIB; prov. Burdur: Dinar, 1984. V. 6., SZD - General distribution: West-Asiatic species. Occurrence: sporadic and rare.

Aphodius (Amidorus) cribrarius Brullé, 1836 - prov. Erzurum: Egerti, 1987. V. 22., RI et RA; prov. Sivas: Kizil Dağ, 1900 m, 1987. V. 23., RI et RA; prov. Erzincan: Basköy, 1989. VI. 7., RI; prov. Giresun: Eğribel pass, 2200 m, 1996. VII. 6., SZD; prov. Tarsus: 50 km N of Tarsus, 5 km N of Gülek, 1329 m, 2006. V. 7., RG et RIB - General distribution: Pontomediterranean species. This species is wide-spread on the eastern mountainous district of Turkey, where frequent.

Aphodius (Amidorus) obscurus (Fabricius, 1792) - prov. Erzincan: Mts. Keşiş, Derekorosu, 1989. VI. 7., RI; prov. Rize: Ovitdağı, 2600 m, 1996. VII. 3-4., RI; prov. Artvin: Çam-pass, 2600 m, 1996. VI. 30., RI; prov. Erzurum: 12 km S of Tortum, 1996. VI. 28., RI - General distribution: European-Anatolian species. Occurrence: wide-spread and frequent.

Aphodius (s.str.) fimetarius (Linnaeus, 1758) - prov. Antalya: Antalya, 1984. V. 7, RI et SZD; Aksu Perge, 1984. V. 8., RI; prov. Içel: Korykos, 1984. V. 12., RI; Mts. Taurus, Yavca, 1984. V. 13., RI; Mts. Taurus, Kerimler, 1984. V. 13., RI; Mts. Taurus, Çamlyayla, 1984. V. 15., RI, RA et SZD; Mts. Taurus, Virenşehir, 1984. V. 13., SZD; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI, RA et SZD; prov. Ankara: Pazar, 1987. V. 12., RI et RA; Akyarma-pass, 1500 m, bank of Aktas-river, 1987. V. 12., RI et RA; prov. Çorlu: Marmaracik, 1987. VI. 3., RI; prov. Sivas: Kizil Dağ, 1900 m, 1987. V. 23, RI; Kizilli, 1987. V. 24., RI; Salur, 1987. V. 23., RI; prov. Erzurum: Mts. Rize, Ispir, 1987. V. 21., RI et RA; prov. Çorum: Alacahöyük, 1987. V. 15., RI et RA; Sekerhacili, 1987. V. 15., RI; prov. Gümüşhane: Telme, 1987. V. 20., RI et RA; vil Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI et RA; prov. Bursa: Demirci, 1989. VI. 14., RI et RA; prov. Artvin: Çankurtaran-pass, 800 m, 1996. VII. 1-2., RI; prov. Samsun: Mahmutlu, 1996. VII. 8., RI et SZD; prov. Kirşehir: Ösbag, 1984. V. 18., SZD; 30 km N of Kirşehir, 10 km SE of Akpinar, 1154 m, 2006. V. 9., RG et RIB prov. Isparta: Asagigökdere, 2001. V. 23., RG et RIB; prov. Balikesir: Kapidaği Yarimadasi, Ballipinar, 2001. V.31 - VI. 1., RG et RIB; prov. Manisa: 5 km SE of Manisa, 2001. V. 15., RG et RIB; prov. Izmir: NE of Zeytindağ, Koyuneli, 2001. V. 14., RG et RIB; prov. Afyon: 30 km N of Afyon, Arslantaş, 2001. V. 25., RG et RIB - General distribution: Palearctic species. Occurrence: very wide-spread and common.

*Aphodius (s.str.) foetidus (*Herbst, 1783) (=*scybalarius* Fabricius, 1792) - prov. Aydin: Umurlu, 1984. V. 4., RI et SZD; prov. Çorlu: Marmaracik, 1987. VI. 3., RI et RA; prov. Çanakkale: Mt. Koru Dağ, Kocaçeşme, 2001. V. 12., RG et RIB; Mt. Kavak Dağı, Ayvacik, 2001. V. 13., RG et RIB; prov. Bursa: Bursa, Mts. Ulu Dağ, 2001. V. 28., RG et RIB; prov. Edirne: Çukurköy, 2001. V. 12., RG et RIB - General distribution: Circummediterranean species. Occurrence: wide-spread and frequent.

Aphodius (Biralus) equinus Faldermann, 1835 - prov. Adana: Kabasakal, 1990. IV. 3., SZD - General distribution: Caucasian-Turanian species. This is a new record for Turkey.

Aphodius (Biralus) satellitius (Herbst, 1789) - prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI, RA et SZD; prov. Sivas: Kizilli, 1987. V. 24., RI; 13 km E of Zara, 1983. V. 23., RI; prov. Ankara: Izzettin, 30 km E of Kirikkale, 1987, V. 13., RI; Yassihöyük, 1987. V. 27., RI; prov. Çorlu: Lüleburgaz, 1987. V. 11., RI et RA; prov. Gümüşhane: Telme, 1987. V. 20., RI et RA; prov. Kirşehir: 30 km N of Kirşehir, 10 km SE of Akpinar, 1154 m, 2006. V. 9., RG et RIB; Ösbağ, 1984. V. 18., SZD; prov. Afyon: Çayirbağ, 2001. V. 25., RG et RIB; prov. Izmir: NE of Zeytindağ, Koyuneli, 2001. V. 14., RG et RIB - General distribution: Circummediterranean species. Occurrence: wide-spread and frequent.

Aphodius (Bodilus) ghardimaouensis Balthasar, 1929 - prov. Sakarya: Kirkpinar, 1984. V. 20., RI; prov. Içel: Mts. Taurus, Kerimler, 1984. V. 13., RI; Mts. Taurus, Yavca, 1984. V. 13., SZD; prov. Antalya: Antalya,

1984. V. 7., SZD - General distribution: Circummediterran species. Occurrence: wide-spread and frequent. Balthasar (1964) considers the subspecies of the Aphodius ictericus (Laich.).

Aphodius (Bodilus) ictericus (Laicharting, 1781) - prov. Izmir: Bergama, NE of Zeytindağ, Koyuneli, 2001. V. 14., RG et RIB - General distribution: European -Anatolian species. Occurrence: sporadic and not frequent.

Aphodius (Bodilus) lugens Creutzer, 1799 - prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI; prov. Ankara: Yassihöyük, 1989. VI. 11., RI; prov. Usak: Banaz, 1989. V. 24., RI; prov. Samsun: Mahmutlu, 1996. VII. 8., RI et SZD; prov. Erzincan: Ganiefendi, Çiftlik Küyü, 1200 m, 1996. VI. 27-28., RI et SZD; 5 km E of Erzincan, 1996. VI. 27., RI; prov. Çorum: Büyükincesu, 1996. VI. 26., RI; prov. Izmir: NE of Zeytindağ, 2001. V. 14., RG et RIB - General distribution: West-Palearctic species. Occurrence: wide-spread and frequent.

Aphodius (Bodilus) punctipennis Erichson, 1848 - prov. Ankara: Yassihöyük, 1989. VI. 11., RI; prov. Erzincan: Ganiefendi Çiftlik Köyü, 1200 m, 1996. VI. 27., SZD - General distribution: Pontic-Turanian species. Occurrence: sporadic and very rare.

Aphodius (Calamosternus) granarius (Linnaeus, 1767) - prov. Nevşehir: Kappadokia, Göreme, 1984. V. 16-17., RI; prov. Keşan: Paşayiğit, 1984. V. 1., RI et RA; prov. Burdur: Dinar, 1984. V. 6., RI, RA et SZD; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI; prov. Sakarya: Düzce, 1984. V. 20., RI; Kirkpinar, 1984. V. 20., RI; prov. Içel: Mts. Taurus, 1600 m, Çamlyayla, 1984. V. 15., RI et SZD; prov. Edirne: Kircasalih, 1984. V. 1., RI; prov. Ankara: Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI et RA; Pazar, 1987. V. 12., RI et RA; Akyarma-pass, 1500 m, bank of Aktas-river, 1987. V. 12., RI; prov. Gümüşhane: Telme, 1987. V. 20., RI et RA; prov. Sivas: 13 km E of Zara, 1987. V. 23., RI; Ortagöze, 1987. V. 23., RI; prov. Eskişehir: Oglacki, 1987. V. 28., RI; Yazilikaya, Midas Şehri, 2001. V. 26., RG et RIB; prov. Çorum: Sekerhacili, 1987. V. 15., RI; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Erzurum: 12 km S of Tortum, 2100 m, 1996. VI. 28., RI; prov. Bitlis: Bitlis, Başur, 1990. IV. 10., SZD; prov. Afyon: 30 km N of Afyon, Arslantaş, 2001. V. 25., RG et RIB; Çobankaya, 2001. V. 24., RG et RIB; prov. Izmir: Mts Boz Dağlari, 12 km N of Ödemiş, 2001. V. 15., RG et RIB; prov. Isparta: Asagigökdere, 2001. V. 23., RG et RIB; prov. Kirşehir: 30 km N of Kirşehir, 10 km SE of Akpinar, 1154 m, 2006. V. 9., RG et RIB; prov. Çanakkale: Mts. Koru Dağ, Kocaçeşme, 2001. V. 12., RG et RIB - General distribution: Cosmopolitan species. Occurrence: very wide-spread and common.

Aphodius (Calamosternus) trucidatus Harold, 1863 - prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI; prov. Sivas: 13 km E of Zara, 1987. V. 23., RI - General distribution: Palearctic species. Occurrence: sporadic and not frequent.

*Aphodius (Chilothorax) distinctus (*Müller, 1776) - prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI; prov. Nevşehir: Kappadokia, Kaymakli, 1984. V. 16., RI; 6 km S of Nevşehir, Çardak Köyü, 1337 m, 2006. V. 8., RG et RIB; Göreme, 1984. V. 15., SZD; prov. Ankara: Akyarma-pass, 1500 m, bank of Aktas-river, 1987. V. 12., RI; Yassihöyük, 1989. VI. 11., RI; 50 km S of Ankara, 1094 m, 2006. V. 17., RG et RIB; prov. Ağri: Meydandaği, 1989. VI. 3., RI; prov. Kirşehir: 30 km N of Kirşehir, 10 km SE of Akpinar, 1154 m, 2006. V. 9., RG et RIB; Ösbağ, 1984. V. 18., SZD - General distribution: European-Anatolian species. Occurrence: wide-spread and common.

Aphodius (Chilothorax) lineolatus Illiger, 1803 - prov. Izmir: NE of Zeytindağ, Koyuneli, 2001. V. 14., RG et RIB - General distribution: Mediterranean species. Occurrence: sporadic and rare.

Aphodius (Chilothorax) melanostictus W. Schmidt, 1840 - prov. Ankara: Yassihöyük, 1989. VI. 11., RI; 50 km S of Ankara, 1094 m, 2006. IV 17., RG et RIB; prov. Erzincan: Ganiefendi Çiftlik Köyü, 1200 m, 1996. VI. 27, at light, SZD - General distribution: West-Mediterranean-Turanian species. Occurrence: sporadic and very rare.

Aphodius (Chilothorax) paykulli Bedel, 1907 - prov. Adiyaman: Kâhta, Karakus, 1990. IV. 6., SZD - General distribution: European-Anatolian species. Occurrence: sporadic and rare.

Aphodius (Chilothorax) pustulifer Reitter, 1892 - prov. Erzincan: 5 km E of Erzincan, 1996. VI. 27., RI - General distribution: Pontic-Turanian species. This is a new record for Turkey.

Aphodius (Chilothorax) sticticus (Panzer, 1798) (=*equestris* Panzer, 1798) - prov. Artvin: Çankurtaran-pass, 800 m, 1996. VII. 1-2., RI; prov. Balikesir: Kapidaği Yarimadasi, Ballipinar, 2001. V. 31-VI. 1., RG et RIB - General distribution: European-Anatolian species. Occurence: not frequent.

Aphodius (Colobopterus) brignolii Carpetano, 1973 - prov. Artvin: Çam pass, 2450 m, 1996. VI. 30., SZD - General distribution: Caucasian species. This is in Anatolia sporadic and rare.

Aphodius (Colobopterus) erraticus (Linnaeus, 1758) - prov. Edirne: Kircasalih, 1984. V. 1., RI; prov. Içel: Mts. Taurus, Kerimler, 1984. V. 13., RI; Anamur, 1984. V. 11., RI et RA; 50 km N of Tarsus, Gülek, 808 m, 2006. IV. 17., RG et RIB; Yavca, 1984. V. 13., SZD; Mts. Taurus, Çamlyayla, 1984. V. 15., SZD; prov.

Kirşehir: Ösbag, 1984. V. 18., RI; 30 km N of Kirşehir, 10 km SE of Akpinar, 1154 m, 2006. V. 9., RG et RIB; prov. Tekirdağ: Saray, 2006. V. 11., RG et RIB; prov. Izmir: NE of Zeytindağ, Koyuneli, 2001. V. 14., RG et RIB; prov. Sakarya: Düzce, 1984. V. 20., RI et RA; Esme, 1987. V. 11., RI et RA; prov. Burdur: Dinar, 1984. V. 6., RI; prov. Balikesir: Kapidağı Yarimadasi, Ballipinar, 2001. V. 31 - VI. 1., RG et RIB; prov. Muğla: Çukurincir, 2001. V. 21., RG et RIB; prov. Afyon: 30 km N of Afyon, Arslantaş, 2001. V. 25., RG et RIB; Çalislar, 2001. V. 25., RG et RIB; Çayirbağ, 2001. V. 25., RG et RIB; Çobankaya, 2001. V. 24., RG et RIB; prov. Nevşehir: 6 km S of Nevşehir, Cardak Köyü, 1337 m, 2006. V. 8., RG et RIB; prov. Ankara: Pazar, shore of lake, 1984. V. 19., 1987. V. 12., RI et SZD; Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI et RA; Keskin, 1984. V. 18., SZD; prov. Aydin: Umurlu, 1984. V. 4., RI, RA et SZD; prov. Eskişehir: Sükrauli Köyü, 1987. V. 29., RI et RA; prov. Kütahya: Yonçali, 2001. V. 27., RG et RIB; 32 km SE of Keles, Esen, 2001. V. 27., RG et RIB; 55 km S of Bözüyük, Eskiyüregil, 2001. V. 27., RG et RIB; prov. Isparta: Asagigökdere, 2001. V. 23., RG et RIB; prov. Amasya: Suluova, 1987. V. 16., RI et RA; prov. Sivas: Kizilli, 1987. V. 24., RI; 13 km E of Zara, 1987. V. 23., RI et RA; Ortagöze, 1987. V. 23., RI et RA; prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI et RA; prov. Çorum: Bogazkale, 1987. V. 14-16., RI; Balgöze, 1987. V. 16., RI; Sekerhacili, 1987. V. 15., RI et RA; Yazilikaya, 1989. VI. 10., RI; prov. Çorlu: Lüleburgaz, 1987. V. 11., RI et RA; prov. Gümüşhane: Siran, 1987. V. 20., RI; Telme, 1987. V. 20., RI et RA; prov. Keşan: Paşayiğit, 1987. V. 1., RI; prov. Kars: Mts. Ararat, 1989. VI. 4., RI et RA; prov. Erzincan: Basköy, 1989. VI. 7., RI; Mts. Keşiş, Derekorosu, 1989. VI. 7., RI; Eşkikeşlik, 1990. IV. 14., SZD; prov. Rize: Ovitdağı, 2600 m, 1996. VII. 3-4, RI; prov. Antalya: Aksu, Perge, 1984. V. 8., SZD; prov. Adana: Kabasakal, 1990. IV. 3., SZD; prov. Erzurum: Erzurum, 1990. IV. 13., SZD; prov. Siirt: Silvan, 1990. IV. 9., SZD; prov. Adiyaman: Kâhta, Karakus, 1990. IV. 6., SZD; prov. Samsun: Mahmutlu, 700 m, 1996. VII. 8., SZD - General distribution: Palearctic species. Occurrence: very wide-spread and common.

Aphodius (Coprimorphus) scrutator (Herbst, 1789) - prov. Kütahya: 32 km SE of Kales, Eşen, 2001. V. 27., RG - General distribution: European-Turanian species. Occurrence: sporadic and rare.

Aphodius (Erytus) cognatus Fairmaire, 1860 - prov. Antalya: Antalya, 1984. V. 7., SZD -General distribution: Circummediterranean species. Occurrence: This is in Asia Minor sporadic, rare.

Aphodius (Esymus) fumigatulus Reitter, 1892 (=sculpturatus Reitter, 1892) - prov. Çanakkale: Ezine, 1984. V. 2., SZD - General distribution: Asianic-Turanian species. Occurrence: sporadic and rare.

Aphodius (Esymus) merdarius (Fabricius, 1775) - prov. Içel: Mts. Taurus, Yavca, 1984. V. 13., RI; Mts. Taurus, 1600 m, Çamlyayla, 1984. V. 15., RI, RA et SZD; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI; prov. Kirşehir: Ösbag, 1984. V. 18., RI et SZD; prov. Ankara: Akyarma-pass, 1500 m, bank of Aktas-river, 1987. V. 12., RI; prov. Erzurum: Egerti, 1987. V. 22., RI et RA; prov. Çorum: Sekerhacili, 1987. V. 15., RI; prov. Tarsus: Gülek, 808 m, 2006. IV. 17., RG et RIB; prov. Antalya: 10 km N of Manavgat, Bucakseyhler, 2001. V. 22., RG et RIB; prov. Balikesir: Kapidağı Yarimadasi, Ballipinar, 2001. V. 31-VI. 1., RG et RIB; prov. Aydin: Umurlu, 1984. V. 4., SZD - European-Turanian species. Occurrence: wide-spread and frequent.

Aphodius (Esymus) pusillus (Herbst, 1789) - prov. Amasya: Suluova, 1987. V. 16., RI; prov. Erzurum: Egerti, 1987. V. 22., RI - General distribution: Euroasiatic species. Occurrence: sporadic and not frequent.

Aphodius (Eudolus) quadriguttatus (Herbst, 1783) - prov. Içel: Mts. Taurus, 1600 m, Çamlyayla, 1984. V. 15., RI, RA et SZD; prov. Ankara: Keskin, 1984. V. 18., RI; 50 km S of Ankara, 1094 m, 2006 IV. 17., RG et RIB; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI et RA; prov. Burdur: Dinar, 1984. V. 6., RI, RA et SZD; prov. Antalya: Aksu, Perge, 1984. V. 8., RI; prov. Niğde: Niğde, 1984. V. 16., RI; prov. Sivas: Kizil Dağ, 1900 m, 1987. V. 23., RI; Kizilli, 1987. V. 24., RI et RA; Salur, 1987. V. 23., RI; Ortagöze, 1987. V. 23., RI et RA; prov. Eskişehir: Oglacki, 1987. V. 28., RI; prov. Gümüşhane: Telme, 1987. V. 20., RI et RA; Siran, 1987. V. 20., RI; prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI et RA; prov. Çorum: Sekerhacili, 1987. V. 15., RI et RA; prov. Erzurum: Egerti, 1987. V. 22., RI; Aksu, 1650 m, 1996. VI. 28., SZD; prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI, 1990. IV. 6., SZD; Kâhta, Karakus, 1990. IV. 6., SZD; prov. Erzincan: Başköy, 1989. VI. 7., RI; prov. Van: Kiziltaş, 1989. VI. 2., RI; prov. Kars: Mts. Ararat, 1989. VI. 4., RI; prov. Afyon: Çalislar, 2001. V. 25., RG et RIB; 15 km NE of Afyon, Atlihisar, 2001. V. 24., RG et RIB; prov. Isparta: Boyali, coast of Eğirdir-gölü, 2001. V. 24., RG et RIB; prov. Kütahya: Yoncali, 2001. V. 27., RG et RIB; prov. Kirşehir: Ösbağ, 1984. V. 18., SZD; prov. Samsun: Mahmutlu, 700 m, 1996. VII. 8., SZD - General distribution: Circummediterranean species. Occurrence: very wide-spread and common.

Aphodius (Eudolus) quadrinaevulus Reitter, 1892 - prov. Tarsus: 50 km N of Tarsus, 5 km N of Gülek, 1329 m, 2006. V. 7., RG et RIB; Gülek, 808 m, 2006. IV. 17., RG et RIB - General distribution: Caucasian-Anatolian species. Occurrence: sporadic and rare.

Aphodius (Eurodalus) paracoenosus Balthasar et Hrubant, 1960 - prov. Kirşehir: Ösbag, 1984. V. 18., RI, RA et SZD; prov. Keşan: Paşayiğit, 1984. V. 1., RI; prov. Aydin: Umurlu, 1984. V. 4., RI; prov. Sakarya: Esme, 1987. V. 11., RI; prov. Sivas: 13 km E of Zara, 1987. V. 23., RI et RA; prov. Kars: Mts. Ararat, 1989. VI. 4., RI; prov. Ağri: Meydandağı, 1989. VI. 3., RI; prov. Afyon: 30 km N of Afyon, Arslantaş, 2001. V. 25., RG et RIB - General distribution: European-Anatolian species. Occurrence: wide-spread and frequent.

Aphodius (Eupleurus) subterraneus (Linnaeus, 1758) - prov. Içel: Mts. Taurus, Yavca, 1984. V. 13., RI; prov. Sakarya: Düzce, 1984. V. 20., RI; prov. Kirşehir: Ösbag, 1984. V. 18., RI, RA et SZD; prov. Nevşehir: 7 km E of Nevşehir, Uçhisar, 1312 m, 2006. V. 9., RG et RIB; 6 km S of Nevşehir, Çardak Köyü, 1337 m, 2006. V. 8., RG et RIB; prov. Kütahya: 32 km SE of Keles, Esen, 2001. V. 27., RG et RIB; prov. Burdur: Dinar, 1984. V. 6., RI; prov. Ankara: Pazar, 1987. V. 12., RI; Izzettin, 30 km E of. Kirikkale, 1987. V. 13., RI; Akyarma-pass, 1500 m, bank of Aktas-river, 1987. V. 12., RI; prov. Amasya: Suluova, 10987. V. 16., RI; prov. Eskişehir: Sükrauli Köyü, 1987. V. 29., RI; prov. Çorum: Bogazkale, 1987. V. 14-16., RI et RA; Sekerhacili, 1987. V. 15., RI et RA; prov. Sivas: 13 km E of Zara, 1987. V. 23., RI; prov. Erzincan: Basköy, 1989. VI. 7., RI; Ganiefendi, Çiftlik Köyü, 1200 m, 1996. VI. 27-28., RI et SZD; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Afyon: Ayazini, 1990. IV. 18., SZD - General distribution: Holarctic species. Occurrence: very wide-spread and common.

Aphodius (Liothorax) plagiatus (Linnaeus, 1767) - prov. Çorum: By. Gülücek, 1987. V. 16., RI; prov. Ankara: Pazar, 1987. V. 12., RI - General distribution: Euroasiatic species. Occurrence: sporadic and not frequent.

Aphodius (Loraphodius) suarius Faldermann, 1835 - prov. Içel: Mts. Taurus, Kerimler, 1984. V. 13., RI et RA - General distribution: European species. This is in Asiatic Turkey sporadic and rare.

Aphodius (Mecynodes) striatulus Waltl, 1835 - prov. Sivas: Kizil Dağ, 1900 m, 1987. V. 23., RI; prov. Çanakkale: Ezine, 1984. V. 2., SZD - General distribution: Mediterranean species. Occurrence: sporadic and rare.

Aphodius (Melinopterus) prodromus (Brahm, 1790) - prov. Ankara: Akyarma-pass, 1500 m, bank of Aktas-river, 1987. V. 12., RI; prov. Erzurum: Egerti, 1987. V. 22., RI et RA; prov. Giresun: Pinarlar, 1987. V. 18., RI; prov. Çorum: Balgöze, 1987. V. 16., RI; Sekerhacili, 1987. V. 15., RI et RA; prov. Kirşehir: Ösbag, 1984. V. 18., SZD; prov. Van: Yenikosk, 1990. IV. 11., SZD - General distribution: Palearctic species. Occurrence: wide-spread and frequent.

Aphodius (Melinopterus) pubescens Sturm, 1800 - prov. Ankara: Akyarma-pass, 1500 m, bank of Aktas-river, 1987. V. 12., RI - General distribution: West-Palearctic species. Occurrence: wide-spread, but not frequent.

Aphodius (Melinopterus) laeviceps Rey, 1890 (= *sabulicola* Thomson, 1868) - prov. Içel: Mts. Taurus, Yavca, 1984. V. 13., RI; prov. Sivas: Kizil Dağ, 1900 m, 1987. V. 23., RI; Sandal, 1987. V. 24., RI; prov. Ankara: Akyarma-pass, 1500 m, valley of Aktas-river, 1987. V. 12., RI.; Pazar, 1987. V. 12., RI; prov. Erzurum: Egerti, 1987. V. 22., RI et RA - General distribution: European-Siberian species. Occurrence: wide-spread and frequent.

Aphodius (Neagolius) abchasicus Reitter, 1892 - prov. Rize: Ovitdağı, 2600 m, 1996. VII. 3-4., RI et SZD - General distribution: Caucasian species. This is a new record for Turkey.

Aphodius (Nialus) digitatus Harold, 1871 - prov. Siirt: Bank of Kahveci, 1989. V. 31., RI - Genral distribution: Mediterranean species. Occurrence: very rare.

Aphodius (Nialus) varians Duftschmid, 1805 - prov. Kirşehir: Ösbag, 1984. V. 18., RI, RA et SZD; 30 km N of Kirşehir, 10 km SE of Akpinar, 1154 m, 2006. V. 9., RG et RIB; prov. Sakarya: Düzce, 1984. V. 20., RI; prov. Eskişehir: Sükrauli Köyü, 1987. V. 29., RI; prov. Çorlu: Lüleburgaz, 1987. V. 11., RI et RA; prov. Çorum: Sekerhecili, 1987. V. 15., RI; prov. Van: Kiziltaş, 1989. VI. 2., RI; prov. Erzincan: 5 km E of Erzincan, 1996. VI. 27., RI; Ganiefendi Çiftlik Köyü, 1200 m, 1996. VI. 27., at light, SZD; prov. Tarsus: Gülek, 808 m, 2006. IV. 17., RG et RIB; prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB; Çalislar, 2001. V. 25., RG et RIB; prov. Çanakkale: Gelibolu Yarimadasi, Bayirköy, 2001. V. 12., RG et RIB; vil Balikesir: Kapidağı Yarimadasi, Ballipinar, 2001. V. 31., RG et RIB; prov. Burdur: Dinar, 1984. V. 6., SZD; prov. Ankara: Pazar, 1984. V. 19., SZD; prov. Bitlis: Küçüksu, 1990. IV. 10., SZD; prov. Adiyaman: Kâhta, Karakus, 1990. IV. 6., SZD - Genral distribution: Palearctic species. Occurrence: wide-spread and common.

Aphodius (Otophorus) haemorrhoidalis (Linnaeus, 1758) - prov. Sakarya: Kirkpinar, 1984. V. 20., RI et RA; Esme, 1987. V. 11., RI; prov. Çorlu: Marmaracik, 1987. VI. 3., RI; prov. Samsun: Mahmutlu, 1996. VII. 8., RI et SZD; prov. Balikesir: Kapidağı Yarimadasi, Ballipinar, 2001. V. 31 - VI. 1., RG et RIB - General distribution: Palearctic species. Occurrence: sporadic and not rare.

Aphodius (Parammoecius) asphaltinus Kolenati, 1846 - prov. Rize: Ovitdaği, 2600 m, 1996. VII. 3-4., RI - General distribution: Caucasian species. It is founds in East-Turkey, rare.

Aphodius (Phalacronotus) citellorum Semenov et Medvedev, 1929 - prov. Çanakkale: Mt. Kavak Dağı, Ayvacik, 2001. V. 13., RG et RIB - General distribution: Pontic species. This is a new record for Turkey.

Aphodius (Phalacronothus) quadrimaculatus (Linnaeus, 1761) - prov. Burdur: Dinar, 1984. V. 6., RI et SZD; prov. Içel: Mts. Taurus, 1600 m, Çamlyayla, 1984. V. 15., RI; prov. Çanakkale: Ezine, 1984. V. 2., RI et SZD; Mt. Kavak Dağı, Ayvacik, 2001. V. 13., RG et RIB; prov. Bursa: Demirci, 1989. VI. 14., RI; prov. Izmir: Bergama, Zeytindağ, 2001. V. 14., RG et RIB - General distribution: European-Siberian species. Occurrence: wide-spread and frequent.

Aphodius (Plagiogonus) nanoides (Balthasar, 1961) - prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB - General distribution: West-Asian species. Occurrence: very rare. This is a new record for Turkey.

Aphodius (Plagiogonus) syriacus Harold, 1863 - prov. Içel: Mts. Taurus, Kerimler, 1984. V. 13., RI et RA; Mts. Taurus, 1600 m, Çamlyayla, 1984. V. 15., RI; prov. Burdur: Dinar, 1984. V. 6., RI et SZD; prov. Erzincan: Basköy, 1989. VI. 7., RI et RA; prov. Eskişehir: Karaagaç Köyü, 1989. VI. 12., RI et RA; prov. Ankara: Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI et RA - East-Mediterranean species. Occurrence: wide-spread and frequent.

Aphodius (Planolinus) vittatus mundus Reitter, 1892 - prov. Kirşehir: Ösbag, 1984. V. 18., RI; prov. Içel: Mts. Taurus, Kerimler, 1984. V. 13., RI; prov. Ankara: Pazar, 1987. V. 12., RI, RA et SZD; prov. Erzincan: 5 km E of Erzincan, 1996. VI. 27., RI - General distribution: East-Mediterranean subspecies. Occurrence: sporadic and not frequent.

Aphodius (Pseudosymus) lucidus Klug, 1845 - prov. Antalya: Antalya, 1984. V. 7., SZD - General distribution: Circummediterranean species. This is a new record for Turkey.

Aphodius (Subrinus) sturmi Harold, 1870 - prov. Samsun: Mahmutlu, 700 m, 1996. VII. 8., SZD - General distribution: Palearctic species. Occurrence: wide-spread, but not frequent.

Aphodius (Teuchestes) fossor (Linnaeus, 1758) - prov. Balikesir: Kapidaği Yarimadasi, Ballipinar, 2001. V. 31 - VI. 1., RG et RIB; prov. Artvin: Çam-pass, 1600 m, 1996. VI. 30., RI - General distribution: Holarctic species. Occurrence: sporadic, not frequent.

Aphodius (Trichonotulus) scrofa (Fabricius, 1787) - prov. Sakarya: Düzce, 1984. V. 20., RI; prov. Ankara: Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI; prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI; prov. Kirşehir: 30 km N of Kirşehir, 10 km SE of Akpinar, 2006. V. 9., RG et RIB; prov. Eskişehir: Yazilikaya, Midas Şehri, 2001. V. 26., RG et RIB; prov. Nevşehir: 6 km S of Nevşehir, Çardak Köyü, 1337 m, 2006. V. 8., RG et RIB; prov. Afyon: Çobankaya, 2001. VC. 24., RG et RIB - General distribution: Euroasiatic species. Occurrence: wide spread and frequent.

Euheptaulacus Dellacasa, 1983

Euheptaulacus carinatus carinatus (Germar, 1824) - prov. Erzurum: Aksu, 1650 m, 1996. VI. 28., at light, SZD - General distribution: Eurasian species. Occurrence: wide-spread and frequent.

Euheptaulacus sus (Herbst, 1783) - prov. Erzincan: 5 km E of Erzincan, 1996. VI. 27., RI; Ganiefendi Çiftlik Köyü, 1200 m, 1996. VI. 27., at. light, SZD - General distribution: European-Anatolian species. Occurrence: wide-spread, rare.

Oxyomus Dejean, 1833

Oxyomus silvestris (Scopoli, 1763) - prov. Gümüşhane: Telme, 1987. V. 20., RI; prov. Antalya: 10 km N of Manavgat, Bucakseyhler, 2001. V. 22., RG et RIB; prov. Içel: Mersin, 1984. V. 12., SZD - General distribution: Eurasian species. This is a new record for Turkey.

Ataenius Harold, 1867

Ataenius horticola Harold, 1869 - prov. Çanakkale: Mts. Kavak Dağı, Ayvacik, 2001. V. 13., RG et RIB - General distribution: European-Anatolian species. Occurrence: sporadic and not frequent.

Leiopsammodius Rakovic, 1981

Leiopsammodius aegialius (Ádám, 1986) - prov. Içel: Mersin, 1984. V. 12., SZD - General distribution: Asianic endemic species.Occurrence: very rare.

Psammodius Fallén, 1807

Psammodius laevipennis Costa, 1844 - prov. Ordu: Çamas, 1987. V. 17., RI; prov. Adiyaman: Bank of Eufrates, 1989. VI. 30., RI; prov. Muğla: Karabögürtlen, 2001. V. 17., RG et RIB; prov. Antalya: 10 km N of Manavgat, Bucakseyhler, 2001. V. 22., RG et RIB; prov. Balikesir: Kapidaği Yarimadasi, Ballipinar, 2001. V. 31-VI. 1., RG et RIB; prov. Istambul: Istambul, 1984. V. 21., SZD - General distribution: Circummediterranean species. Occurrence: sporadic and frequent.

Pleurophorus Mulsant, 1842

Pleurophorus anatolicus Petrovitz, 1961 - prov. Içel: Mersin, 1984. V. 12., RI et SZD; prov. Eskişehir: Seyitgazi, 1989. VI. 12., RI; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI; prov. Erzincan: 5 km E of Erzincan, 1996. VI. 27., RI; Ganiefendi Çiftlik Köyü, 1200 m, 1996. VI. 27., at light, SZD; prov. Erzurum: Tortum, 1996. VI. 28., RI; Aksu, 1650 m, 1996. VI. 28., at light, SZD; prov. Çorum: Büyükincesu, 800 m, 1996. VI. 26., SZD - General distribution: East-Mediterranean species. Occurrence: wide-spread and frequent.

Pleurophorus apicipennis Reitter, 1892 - prov. Antalya: 10 km N of Manavgat, Bucakseyler, 2001. V. 22., RG et RIB; prov. Muğla: Karabögürtlen, 2001. V. 17., RG et RIB; prov. Balikesir: Kapidaği Yarimadasi, Ballipinar, 2001. V. 31 - VI. 1., RG et RIB - General distribution: Asianic-Turanian species. Occurrence: sporadic and very rare. This is a new record for Turkey.

Pleurophorus caesus (Creutzer, 1796) - prov. Içel: Mersin, 1984. V. 12., SZD; prov. Istambul: Istambul, 1984. V. 21., SZD; prov. Erzincan: Ganiefendi Çiftlik Köyü, 1200 m, 1996. VI. 27., at light, SZD - General distribution: West-Palearctic species. Occurrence: wide-spread and frequent.

Rhyssemus Mulsant, 1842

Rhyssemus algiricus meridionalis Reitter, 1901 - prov. Erzincan: Ganiefendi Çiftlik Köyü, 1200 m, 1996. VI. 27., at light, SZD; prov. Erzurum: Aksu, 1650 m, 1996. VI. 28., at light, SZD - General distribution: North-African species. This subspecies lives from Greece to Caucasus. This is a new record for Turkey.

Rhyssemus germanus (Linnaeus, 1767) - prov. Adiyaman: Bank of Eufrates, 1989. V. 30., RI; prov. Erzincan: 5 km E of Erzincan, 1996. VI. 27., RI - General distribution: Palearctic species. Occurrence: sporadic and frequent.

Scarabaeidae

Gymnopleurus Illiger, 1803

Gymnopleurus flagellatus (Fabricius, 1787) - prov. Burdur: Dinar, 1984. V. 6., RI et SZD; prov. Sivas: Ortagöze, 1987. V. 23., RI; prov. Rize: Mts. Rize, Dereköy, 1987. V. 21., RI; prov. Çorum: Bogazkale, 1984. V. 14-16., RI et RA; Sekerhacili, 1987. V. 15., RI et RA; prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI; prov. Ankara: Dereköy, 1987. V. 27., RI et RA; Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI et RA; Kalecik, 1987. V. 13., RI et RA; Yassihöyük, 1989. VI. 11., RI; Keskin, 1984. V. 18., SZD; Şereflikoçhisar, 1990. IV. 2., SZD; prov. Eskişehir: Oglacki, 1987. V. 28., RI; prov. Afyon: Çalislar, 2001. V. 25., RG et RIB; 15 km NW of Afyon, Atlihisar, 2001. V. 24., RG et RIB; Çobankaya, 2001. V. 24., RG et RIB; prov. Gümüşhane: Telme, 1987. V. 20., RI; prov. Kars: Mts. Ararat, 1989. VI. 4., RI et RA; prov. Van: Kayabogaz, 1989. VI. 1., RI; prov. Ağri: Meydandaği, 1989. VI. 3., RI et RA; prov. Gaziantep: Gaziantep, 1990. IV. 15., OA, 1990. IV. 5., SZD; prov. Siirt: Silvan, 1990. IV. 9., SZD; prov. Adiyaman: Nemrut Daği, 1990. IV. 6., SZD; prov. Niğde: Aksaray, 1990. IV. 17., SZD - General distribution: Palearctic species. Occurrence: wide-spread and common.

Gymnopleurus geoffroyi (Fuessly, 1775) - prov. Edirne: Paşayiğit, 1984. V. 1., RI, RA et SZD; 4 km N of Keşan, 2001. V. 12., RG et RIB; prov. Burdur: Dinar, 1984. V. 6., RI et SZD; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI, RA et SZD; 2001. V. 16-17., RG et RIB; 3 km N of Buldan, 2001. V. 16., RG et RIB; prov. Çorum: Bogazkale, 1987. V. 14-16., RI et RA, 1000 m, 1996. VI. 26., SZD; Sekerhacili, 1987. V. 15., RI et RA; Osmancik, 450 m, 1996. VII. 8., RI et SZD; prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI et RA; prov. Amasya: Suluova, 1987. V. 16., RI et RA; prov. Eskişehir: Oglacki, 1987. V. 28., RI; Kirka, 1989. VI. 13., RI et RA; Seyitgazi, 2001. V. 26., RG et RIB; prov. Ankara: Kalecik, 1987. V. 13., RI et RA; prov. Bursa: Demirci, 1989. VI. 14., RI; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Isparta: Boyali, Eğridir Gölü, 2001. V. 24., RG; Asagigökdere, 2001. V. 23., RG; prov. Afyon: Çalislar, 2001. V. 25., RG et RIB; Çobankaya, 2001. V. 24., RG et RIB; prov. Izmir: NE of Zeytindağ, Koyuneli, 2001. V. 14., RG et RIB; Bergama, 2001. V. 14., RG et RIB; Bergama, Akropolis, 1984. V. 3., SZD; Mts. Boz Dağlari, 12 km N of

Ödemis, 2001. V. 15., RG et RIB; prov. Muğla: 5 km NW of Kargi, Katranci, 2001. V. 18-20., RG et RIB; prov. Balikesir: Kapidaği Yarimadasi, Çakilköy, 2001. VI. 1., RG et RIB; prov. Manisa: Sartmustafa, Sardes, 2001. V. 15., RG et RIB; prov. Kütahya: Yoncali, 2001. V. 27., RG et RIB; prov. Tekirdağ: Saray, 172 m, 2006. V. 11., RG et RIB; prov. Kirklareli: 20 km W of Vize, Erenzer, 2006. V. 11., RG et RIB; prov. Çanakkale: Ezine, 1984. V. 2., SZD; prov. Antalya: Serik, 1984. V. 8., SZD; prov. Adana: Kabasakal, 1990. IV. 3., SZD; prov. Adiyaman: Naringce, 1990. IV. 7., SZD; Kâhta, Karakus, 1990. IV. 6., SZD; Nemrut Dağı, 1990. IV. 6., SZD; prov. Siirt: Silvan, 1990. IV. 9., SZD; prov. Diyarbakir: 2 km E of Silvan, 1990. IV. 9., SZD - General distribution: European-Anatolian species. Occurrence: wide-spread and common.

Gymnopleurus mopsus (Pallas, 1781) - prov. Burdur: Dinar, 1984. V. 6., RI; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI et RA; prov. Aydin: Ortaklar, 1984. V. 4., RI; prov. Ankara: Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI et RA; Yassihöyük, 1987. V. 27., 1989. VI. 11., RI et RA; Keskin, 1984. V. 18., SZD; prov. Eskişehir: Oglacki, 1987. V. 28., RI et RA; Kirka, 1989. VI. 13., RI et RA; Karaağac Köyü, 1989. VI. 13., RI; Seyitgazi, 2001. V. 26., RG et RIB; prov. Edirne: Paşayiğit, 1989. V. 21., RI et RA; prov. Çorum: Osmancik, 450 m, 1996. VII. 8., RI et SZD; prov. Ağri: Dogubayazit, 2000. VI. 12-13., RG; prov. Isparta: Asagigökdere, 2001. V. 23., RG et RIB; prov. Afyon: Çayirbağ, 2001. V. 25., RG et RIB; prov. Muğla: Çukurincir, 2001. V. 21., RG et RIB; prov. Kirklareli: 10 km SE of Kirklareli, Kizilcikdere, 205 m, 2006. V. 11., RG et RIB; prov. Balikesir: Kapidaği Yarimadasi, Çakilköy, 2001. VI. 1., RG et RIB; prov. Nevşehir: Kaymakli, 1984. V. 16., SZD; prov. Adana: Kabasakal, 1990. IV. 3., SZD - General distribution: Palearctic species. Occurrence: wide-spread and very frequent.

Scarabaeus Linnaeus, 1758

Scarabaeus (s.str.) pius (Illiger, 1893) - prov. Kayseri: Yeşilhisar, 1990. IV. 15., OA et SZD; prov. Çanakkale: Ezine, 1984. V. 2., RI, RA et SZD; prov. Ankara: Kalecik, 1987. V. 13., RI et RA; Tuz Gölü, 8 km N of Sereflikochisar, 1990. IV. 25., leg. Herczig B. et Ronkay G.; prov. Adiyaman: Mts. Nemrut, 1800 m, 1989. V. 29., RI et RA, 1990. IV. 6., SZD; prov. Bursa: Demirci, 1989. VI. 14., RI; prov. Çorum: Osmancik, 460 m, 1996. VII. 8., RI et SZD; prov. Denizli: 5 km N of Sariabat, 2001. V. 17., RG et RIB; Pamukkale, 2001. V. 16.17., RG et RIB; prov. Kütahya: 32 km SE of Keles, Esen, 2001. V. 27., RG et RIB; prov. Kirşehir: 30 km N of Kirşehir, 10 km SE of Akpinar, 1154 m, 2006. V. 9., RG et RIB; prov. Van: Gedikbulakköyü, 1990. IV. 11., SZD; prov. Kirklareli: Kuzulu Köyü, 500 m, 1996. VI. 24., SZD - General distribution: Mediterranean species. Occurrence: wide spread, but not frequent.

Scarabaeus (s.str.) sacer Linnaeus, 1758 - prov. Adiyaman: Bank of Pamukçay-river, 1989. V. 31., RI - General distribution: Circummediterranean species. Occurrence: sporadic and not frequent.

Scarabaeus (s.str.) typhon Fischer-Waldheim, 1823 - prov. Kayseri: Yesilhisar, 1990. IV. 15., OA; prov. Sivas: Gürün, 1500 m, 1991. VI. 18-19., SC; prov. Kirklareli: Kuzulu Köyü, 1966. VI. 24., RI; prov. Ağri: Dogubayazit, 2000. VI. 12-13., RG; prov. Afyon: 15 km NE of Afyon, Atlihisar, 2001. V. 24., RG et RIB - General distribution: Palearctic species. Occurrence: sporadic and not frequent.

Scarabaeus (Ateuchetus) puncticollis (Latreille, 1819) - prov. Denizli: Çardak, 1984. V. VI., RI; prov. Kirşehir: Ösbag, 1984. V. 18., RI; prov. Çanakkale: Ezine, 1984. V. 2., 1989. V. 23., RI; prov. Sivas: Salur, 1987. V. 23., RI et RA; 13 km E of Zara, 1987. V. 23., RI; Ortagöze, 1987. V. 23., RI et RA; Kizil Dağ, 1900 m, 1987. V. 23., RI; prov. Çorum: By. Gülücek, 1987. V. 16., RI; prov. Ankara: Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI; Kalecik, 1987. V. 13., RI; prov. Gümüşhane: Siran, 1987. V. 20., RI et RA; Mts. Gümüşhane, 1600 m, Alucra, 1987. V. 19., RI; vil Eskişehir: Seyitgazi, 1987. V. 29., RI; Oglacki, 1987. V. 28., RI et RA; Kirka, 1989. VI. 13., RI; prov. Amasya: Suluova, 1987. V. 16., RI; prov. Kars: Mts. Ararat, 1800 m, 1989. VI. 4., RI et RA; prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI et RA; prov. Bursa: Demirci, 1989. VI. 14., RI et RA; prov. Van: Kayabogaz, 1989. VI. 1., RI et RA; prov. Afyon: Afyonkarahisar, 1990. IV. 18., OA; Ayazini, 1990. IV. 18., SZD; prov. Nevşehir: Kaymakli, 1984. V. 16., SZD - General distribution: Mediterranean species. Occurrence: wide-spread and common.

Scarabaeus (Ateuchetus) variolosus Fabricius, 1787 - prov. Izmir: Bergama, Pergamon, 1984. V. 3., RI, RA et SZD; NE of Zeytindağ, Koyuneli, 2001. V. 14., RG et RIB; prov. Çanakkale: Ezine, 1984. V. 2., RI et SZD - General distribution: Circummediterranean species. Occurrence: sporadic and not frequent.

Sisyphus Latreille, 1807

Sisyphus schaefferi schaefferi (Linnaeus, 1758) - prov. Erzurum: Askale, 1990. IV. 13., OA; prov. Izmir: Bergama, Pergamon, 1984. V. 3., 1989. V. 23., RI et RA; prov. Edirne: Paşayiğit, 1984. V. 1., RI; prov. Çorum: Bogazkale, 1987. V. 16., RI et RA; Sekerhacili, 1987. V. 15., RI; Büyükincesu, 1996. VI. 26., RI; prov. Sivas:

13 km E of Zara, 1987. V. 23., RI; Ortagöze, 1987. V. 23., RI; prov. Ankara: Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI; Pazar, 1987. V. 12., RI; Keskin, 1984. V. 18., SZD; prov. Gümüşhane: Mts. Gümüşhane, 1600 m, Alucra, 1987. V. 19., RI; Siran, 1987. V. 20., RI; prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI et RA; prov. Kars: Mts. Ararat, 1989. VI. 4., RI et RA; prov. Van: Kayabogaz, 1989. VI. 1., RI; Gedikbulakköyü, 1990. IV. 11., SZD;prov. Samsun: Mahmutlu, 1996. VII. 8., RI et SZD; prov. Muğla: Köycegiz, 2001. V. 18., RG et RIB; prov. Balikesir: Kapidaği Yarimadasi, Ballipinar, 2001. V. 31 - VI. 1., RG et RIB; Mts. Kapi Dağ, Erdek, 400 m, 2001. VI. 2., RG et RIB; prov. Eskişehir: Seyitgazi, 2001. V. 26., RG et RIB; prov. Kütahya: Yoncali, 2001. V. 27., RG et RIB; prov. Telirdağ: Inecik, 2001. VI. 5., RG et RIB; prov. Burdur: Dinar, 1984. V. 6., SZD - General distribution: Palearctic species. Occurrence: wide-spread and common.

Sisyphus schaefferi boschniaki Fischer-Waldheim, 1823 - prov. Eskişehir: Yazilikaya, Midas Şehri, 2001. V. 26., RG - General distribution: Pontic-Siberian subspecies. Occurrence: wide-spread , but not frequent.

Copris Müller, 1764

Copris cavolinii Petagna, 1792 - prov. Eskişehir: Midas Şehri, 1989. VI. 12., RI; Kirka, 1989. VI. 13., RI; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Bursa: Demirci, 1989. VI. 14., RI; prov. Adiyaman: Mts. Nemrut, 1800 m, 1989. V. 29., RI; prov. Içel: Mts. Taurus, Kerimler, 1984. V. 13., RI et RA; Mts. Taurus, Çamlyayla, 1984. V. 15., SZD; Cendere, Köprü, 1990. IV. 6., SZD; Narince, 1990. IV. 7., SZD; prov. Niğde: Niğde, 1984. V. 16., RI; prov. Çorum: Bogazkale, 1984. V. 14-16., RI et RA; Sekerhacili, 1987. V. 15., RI; prov. Ankara: Yassihöyük, 1987. V. 27., RI et RA; Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI; prov. Çorlu: Lüleburgaz, 1987. V. 11., RI; prov. Sivas: Gürün, 1500 m, SC; prov. Izmir: NE of Zeytindağ, Koyuneli, 2001. V. 14., RG et RIB; prov. Muğla: Çukurincir, 2001. V. 21., RG et RIB; prov. Isparta: Asagigökdere, 2001. V. 23., RG et RIB; prov. Afyon: 30 km N of Afyon, Arslantaş, 2001. V. 25., RG et RIB; 15 km NE of Afyon, Atlihisar, 2001. V. 24., RG et RIB; Çalislar, 2001. V. 25., RG et RIB; Ayazini, 1990. IV. 18., SZD; prov. Bursa: Mts. Ulu Dağ, 1200 m, Bursa, 2001. V. 28., RG et RIB; prov.Kirikkale: 12 km S of Kirikkale, Kurson Kaya Köyü, 942 m, 2006, V. 9., RG et RIB; prov. Kirşehir: 30 km N of Kirşehir, 10 km SE of Akpinar, 1154 m, 2006. V. 8., RG et RIB; Ösbağ, 1984. V. 18., SZD; prov. Adana: Kabasakal, 1990. IV. 3., SZD; prov. Diyarbakir: Alipaşa, 1990. IV. 9., SZD; prov. Kayseri: Yeşilhisar, 1990. IV. 15., SZD - General distribution: Eurasian species. Occurrence: wide-spread and frequent. Baraud (1992) considered the subspecies of Copris hispanus (Linnaeus, 1764).

Copris lunaris (Linnaeus, 1758) - prov. Edirne: Paşayiğit, 1984. V. 1., RI; Edirne, 1984. V. 24., RI; prov. Içel: Mts. Taurus, Çamlyayla, 1984. V. 15., RI et SZD; prov. Kirşehir: Ösbag, 1984. V. 18., RI et SZD; 30 km N of Kirşehir, 10 km SE of Akpinar, 1154 m, 2006. V. 8., RG et RIB; prov. Çorum: By. Gülücek, 1987. V. 16., RI et RA; Sekerhacili, 1987. V. 15., RI et RA; Büyükincesu, 800 m, 1996. VI. 26., SZD; prov. Sivas: Ortagöze, 1987. V. 23., RI et RA; Salur, 1987. V. 23., RI et RA; 13 km E of Zara, 1987. V. 23., RI et RA; Kizilli, 1987. V. 24., RI; prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI; prov. Gümüşhane: Siran, 1987. V. 20., RI et RA; Telme, 1987. V. 20., RI et RA; prov. Eskişehir: Sükrauli Köyü, 1987. V. 29., RI; Kümbet, 1987. V. 30., RI; Karaağac Köyü, 1989. VI. 12., RI et RA; Kirka, 1989. VI. 13., RI; Yazilikaya, Midas Şehri, 2001. V. 26., RG; prov. Kars: Mts. Ararat, 1989. VI. 4., RI et RA; prov. Yozgat: Derbent, 1989. VI. 10., RI; prov. Erzincan: Refahye, 1989. VI. 8., RI et RA; Basköy, 1989. VI. 7., RI; Ganiefendi Çiftlik Köyü, 1200 m, 1996. VI. 27., SZD; prov. Kütahya: 55 km S of Bözüyük, Eskiyüregil, 2001. V. 27., RG et RIB; prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB; 30 km N of Afyon, Arslantaş, 2001. V. 25., RG et RIB; prov. Nevşehir: 6 km S of Nevşehir, Çardak Köyü, 1337 m, 2006. V. 8., RG et RIB; prov. Ankara: Pazar, 1984. V. 19., SZD; prov. Samsun: Mahmutlu, 700 m, 1996. VII. 8., SZD - General distribution: European-Anatolian species. Occurrence: wide-spread and very frequent.

Copris armeniacus Faldermann, 1835 - prov. Van: Kayabogaz, 1989. VI. 1., RI; prov. Kars: Mts. Ararat, 1989. VI. 4., RI; prov. Erzincan: Refahiye, 1989. VI. 8., RI - General distribution: Caucasian species. This is on the mountainous district of East-Anatolia sporadic and rare.

Euoniticellus Janssens, 1953

Euoniticellus fulvus (Goeze, 1977) - prov. Burdur: Dinar, 1984. V. 6., RI, RA et SZD; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI, RA et SZD; prov. Içel: Çamlyayla, 1984. V. 15., RI et SZD; Mts. Taurus, Kerimler, 1984. V. 13., RI; Mts. Taurus, Yavca, 1984. V. 13., RI et SZD; prov. Sakarya: Düzce, 1984. V. 20., RI; prov. Edirne: Paşayiğit, 1984. V. 1., RI; prov. Kirşehir: Ösbag, 1984. V. 18., RI et SZD; prov. Sakarya: Kirkpinar, 1984. V. 20., RI; prov. Aydin: Umurlu, 1984. V. 4., RI, RA et SZD; prov. Ankara: Pazar, shore of lake, 1984. V. 19., RI; Kalecik, 1987. V. 13., RI; prov. Gümüşhane: Telme, 1987. V. 20., RI; prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI; prov. Eskişehir: Çukurca Köyü, 1987. V. 29., RI; prov.

Çorlu: Lüleburgaz, 1987. V. 11., RI; prov. Uşak: Banaz, 1989. V. 24., RI et RA; prov. Samsun: Mahmutlu, 1996. VII. 8., RI et SZD; prov. Afyon: Arslantaş, 30 km N of Afyon, 2001. V. 25., RG; Çobankaya, 2001. V. 24., RG et RIB; Çayirbağ, 2001. V. 25., RG et RIB; prov. Muğla: Çukurincir, 2001. V. 21., RG et RIB; prov. Balikesir: Kapidağı Yarimadasi, Çakilköy, 2001. VI. 1., RG et RIB; Kapidağı Yarimadasi, Ballipinar, 2001. V. 31 - VI. 1., RG et RIB; prov. Kütahya: 32 km SE of Keles, Esen, 2001. V. 27., RG et RIB; prov. Isparta: Asagigökdere, 2001. V. 23., RG et RIB; prov. Bursa: Mts. Ulu Dağ, Bursa, 1200 m, 2001. V. 28., RG et RIB; prov. Kirklareli: 10 km SE of Kirklareli, Kizilcikdere, 205 m, 2006. V. 11., RG et RIB; prov. Nevşehir: 6 km S of Nevşehir, Çardak Köyü, 1337 m, 2006. V. 8., RG et RIB; prov. Tekirdağ: Saray, 172 m, 2006. V. 11., RG et RIB - General distribution: West-Palearctic species. Occurrence: very wide-spread and common.

Euoniticellus pallipes (Fabricius, 1781) - prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI; prov. Burdur: Dinar, 1984. V. 6., RI; prov. Aydin: Umurlu, 1984. V. 4., RI et SZD; prov. Siirt: Bank of Kahveci, 1989. V. 31., RI; prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB; prov. Isparta: coast of Eğirdir-gölü, Boyali, 2001. V. 24., RG et RIB; Asagigökdere, 2001. V. 23., RG et RIB; prov. Muğla: Çukurincir, 2001. V. 21., RG et RIB - General distribution: Eurasian species. Occurence: wide-spread, but not frequent.

Oniticellus Serville, 1825

Oniticellus (Paroniticellus) festivus (Steven, 1809) - prov. Çorum: Sekerhacili, 1987. V. 15., RI; prov. Kirşehir: 30 km N of Kirşehir, 10 km SE of Akpinar, 1154 m, 2006. V. 9., RG et RIB - General distribution: Pontic species. Occurrence: sporadic and rare.

Bubas Mulsant, 1842

Bubas bison (Linnaeus, 1767) - prov. Izmir: Zeytindağ, 2001. V. 14., RG et RIB; prov. Adana: Kabasakal, 1990. IV. 3., SZD - General distribution: Mediterranean species. This is a new record for Turkey.

Bubas bubaloides Janssens, 1938 - prov. Içel: Mts. Taurus, Viranşehir, 1984. V. 13., SZD - General distribution: Circummediterranean species. Occurrence: sporadic, not frequent.

Chironitis Lansberge, 1875

Chironitis furcifer (Rossi, 1792) - prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI et RA; prov. Bursa: Demirci, 1989. VI. 14., RI - General distribution: Circummediterranean species. Occurrence: sporadic and not frequent.

Chironitis haroldi (Ballion, 1870) - prov. Ankara: Yassihöyük, 1989. VI. 11., RI; prov. Adana: Hieropolis, 1989. V. 27., RI; Kabasakal, 1990. IV. 3., SZD; prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI; prov. Siirt: south shore of lake Van, 1989. VI. 1., RI; prov. Diyarbakir: Alipaşa, 1990. IV. 9., SZD - General distribution: Caucasian-Turanian species. It lives in East-Anatolia, very rare.

Onitis Fabricius, 1798

Onitis damoetas Steven, 1806 - prov. Denizli: Pasmukkale, Hierapolis, 1984. V. 5., RI, RAet SZD; prov. Izmir: Bergama, Pergamon, 1984. V. 3., RI; NE of Zeytindağ, Koyuneli, 2001. V. 14., RG; prov. Kirşehir: Ösbag, 1984. V. 18., RI; prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB - General distribution: Pontomediterranean species. Occurrence: sporadic and not frequent.

Onitis humerosus (Pallas, 1771) - vil Içel: Mts. Taurus, Kerimler, 1984. V. 13., RI et RA; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI, RAet SZD; prov. Ankara: Yassihöyük, 1987. V. 27., 1989. VI. 11., RI et RA; prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI; Narince, 1990. IV. 7., SZD; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Izmir: NE of Zeytindağ, Koyuneli, 2001. V. 14., RG; prov. Afyon: Çayirbag, 2001. V. 25., RG; prov. Adana: Kabasakal, 1990. IV. 3., SZD; prov. Diyarbakir: Alipaşa, 1990. IV. 9., SZD - General distribution: Eurasian species. Occurrence: wide-spread and frequent.

Caccobius Thomson, 1859

Caccobius histeroides (Ménétriés, 1832) - prov. Denizli: Çardak, 1984. V. 6., RI; Pamukkale, Hierapolis, 1984. V. 5., SZD; prov. Burdur: Dinar, 1984. V. 6., RI et SZD; prov. Kirşehir: Ösbag, 1984. V. 18., RI; prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI et RA; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Edirne: Paşayiğit, 1989. V. 21., RI; prov. Bursa: Demirci, 1989. VI. 14., RI; prov. Ankara: Yassihöyük, 1989. V. 11., RI; prov. Ağri: Meydandaği, 1989. VI. 3., RI; prov. Van: Gedikbulakköyü, 1990. IV. 11., SZD - General distribution: Pontomediterranean species. Occurrence: wide-spread and frequent.

Caccobius schreberi (Linnaeus, 1767) - prov. Erzincan: Ganiefendi, Ciftlik Köyü, 1200 m, 1996. VI. 27-28., RI; Yaylakent, 1989. VI. 7., RI; prov. Çorum: Bogazkale, 1987. V. 14-16., 1989. VI. 10., RI et RA; Sekerhacili, 1987. V. 15., RI et RA; Osmancik, 450 m, 1996. VII. 9., SZD; prov. Sivas: 13 km E of Zara, 1987. V. 23., RI et RA; Ortagöze, 1987. V. 23., RI et RA; Kizilli, 1987. V. 24., RI; prov. Çorlu: Lüleburgaz, 1987. V. 11., RI et RA; prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI et RA; prov. Eskişehir: Çukurca Köyü, 1987. V. 29., RI et RA; Yazilikaya, 1987. V. 29., RI; Sükrauli Köyü, 1987. V. 29., RI et RA; Kümbet, 1987. V. 30., RI; Oglacki, 1987. V. 29., RI; Kirka, 1989. VI. 13., RI; Karaağac Köyü, 1989. VI. 12., RI; prov. Ankara: Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI et RA; prov. Gümüşhane: Telme, 1987. V. 20., RI et RA; prov. Sakarya: Esme, 1987. V. 11., RI; prov. Rize: Mts. Rize, Dereköy, 1987. V. 21., RI et RA; prov. Bursa: Demirci, 1989. VI. 14., RI; prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI et RA, 1990. IV. 6., SZD; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Siirt: Bank of Kahveci, 1989. V. 31., RI; prov. Ağri: Meydandağı, 1989. VI. 3., RI; prov. Isparta: Boyali, Eğirdir Gölü, 2001. V. 24., RG; vil Izmir: NE of Zeytindağ, Koyuneli, 2001. V. 14., RG et RIB; prov. Aydin: Umurlu, 1984. V. 4., SZD; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., SZD; prov. Burdur: Dinar, 1984. V. 6., SZD; prov. Içel: Mts. Taurus, Yavca, 1984. V. 13., SZD; Mts. Taurus, Çamlyayla, 1984. V. 15., SZD; prov. Kirşehir: Ösbağ, 1984. V. 18., SZD - General distribution: European-Turanian species. Occurrence: very wide-spread and common.

Euonthophagus Balthasar, 1959

Euonthophagus amyntas alces Fabricius, 1792 - prov. Ankara: Pazar, shore of lake, 1984. V. 19., 1987. V. 12., RI et RA; Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI et RA; Yassihöyük, 1989. VI. 11., RI et RA; prov. Niğde: Niğde, 1984. V. 10., RI; prov. Aydin: Umurlu, 1984. V. 4., RI; prov. Içel: Mts. Taurus, Çamlyayla, 1984. V. 15., RI et RA; Mts. Taurus, Yavca, 1984. V. 13., RI et RA; Mts. Taurus, Kerimler, 1984. V. 13., RI et RA; Sarikavak, 1989. V. 27., RI; prov. Burdur: Dinar, 1984. V. 6., RI, RA et SZD; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI; 3 km N of Buldan, 2001. V. 16., RG et RIB; prov. Edirne: Paşayiğit, 1984. V. 1., 1989. VI. 21., RI; prov. Gümüşhane: Mts. Gümüşhane, 1600 m, Alucra, 1987. V. 19., RI; Telme, 1987. V. 20., RI; prov. Afyon: Kunduzlu, 1987. V. 30., RI; 30 km N of Afyon, Arslantaş, 2001. V. 25., RG et RIB; Çayirbağ, 2001. V. 25., RG et RIB; Çobankaya, 2001. V. 24., RG et RIB; prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI; prov. Çorlu: Marmaracik, 1987. VI. 3., RI et RA; Lüleburgaz, 1987. V. 11., RI et RA; prov. Sivas: 13 km E of Zara, 1987. V. 23., RI; Ortagöze, 1987. V. 23., RI et RA; prov. Çorum: Balgöze, 1987. V. 16., RI; prov. Rize: Mts. Rize, Dereköy, 1987. V. 21 RI; prov. Van: Kiziltaş, 1989. VI. 2., RI et RA; Karabogaz, 1989. VI. 1., RI; prov. Eskişehir: Kirka, 1989. VI. 13., RI; Karaağac Köyü, 1989. VI. 12., RI; Yazilikaya, Midas Şehri, 2001. V. 26., RG et RIB; Seyitgazi, 2001. V. 26., RG et RIB; prov. Bursa: Demirci, 1989. VI. 14., RI; prov. Kars: Mts. Ararat, 1989. VI. 4., RI; prov. Adiyaman: Mts. Nemrut, 1800 m, 1989. V. 29., RI et RA; prov. Uşak: Banaz, 1989. V. 24., RI et RA; prov. Ağri: Meydandağı, 1989. VI. 3., RI; prov. Siirt: Sapur Dinlemne Yeri, 1989. VI. 1., RI; prov. Samsun: Mahmutlu, 1996. VII. 8., RI; prov. Kütahya: 32 km SE of Keles, Esen, 2001. V. 27., RG et RIB; Yoncali, 2001. V. 27., RG et RIB; prov. Izmir: Ne of Zeytindağ, Koyuneli, 2001. V. 14., RG et RIB; Zeytindağ, 2001. V. 14., RG et RIB; Bergama, Akropolis, 1984. V. 3., SZD; prov. Balikesir: Kapidağı Yarimadasi, Ballipinar, 2001. V. 31 - VI 1., RG et RIB; prov. Manisa: Sartmustafa, Sardes, 2001. V. 15., RG et RIB; prov. Çanakkale: Ezine, 1984. V. 2., SZD; prov. Içel: Mts. Taurus, Yavca, 1984. V. 13., SZD; prov. Adana: Kabasakal, 1990. IV. 3., SZD; prov. Diyarbakir: Alipaşa, 1990. IV. 9., SZD - General distribution: Eurasian species. This subspecies lives in Central-, East-Europa and Asia Minor. Occurrence: very wide-spread and common.

Euonthophagus atramentarius (Ménétriés, 1832) - prov. Kirşehir: Ösbag, 1984. V. 18., RI, RA et SZD; prov. Edirne: Paşayiğit, 1984. V. 1., RI; prov. Burdur: Dinar, 1984. V. 6., RI et RA; prov. Izmir: Bergama, Pergamon, 1984. V. 3., RI, RA et SZD; Ne of Zeytindağ, Koyuneli, 2001. V. 15., RG et RIB; prov. Içel: Mts. Taurus, Yavca, 1984. V. 13., RI et SZD; Mts. Taurus, Kerimler, 1984. V. 13., RI et RA; Anamur, 1984. V. 11., RI; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI, RA et SZD; 2001. V. 16-17; RG et RIB; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Van: Kiziltaş, 1989. VI. 2., RI; prov. Eskişehir: Yazilikaya, Midas Şehri, 2001. V. 26., RG; prov. Isparta: Boyali, Eğridir Gölü, 2001. V. 24., RG; vil Muğla: Çukurincir, 2001. V. 21., RG et RIB; 5 km NW of Kargi, Katranci, 2001. V. 18-20., RG et RIB;prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB; prov. Çanakkale: Ayvacik, 2001. V. 13., RG et RIB; Ezine, 1984. V. 2., SZD; prov. Adana: Kabasakal, 1990. IV. 3., SZD; prov. Adiyaman: Nemrut Dağı, 1990. IV. 6., SZD; Kâhta, Karakus, 1990. IV. 6., SZD; prov. Diyarbakir: Alipaşa, 1990. IV. 9., SZD; prov. Niğde: Aksaray, 1990. IV. 17., SZD; prov. Çorum: Osmancik, 450 m, 1996. VII. 9., SZD; prov. Gaziantep: Gaziantep, 1990. IV. 5., SZD - General distribution: Pontomediterranean species. Occurrence: wide-spread and very frequent.

Euonthophagus gibbosus (Scriba, 1790) - prov. Ankara: Pazar, shore of lake, 1984. V. 19., 1987. V. 12., RI et SZD; Keskin, 1984. V. 18., SZD; prov. Kirşehir: Ösbag, 1984. V. 18., RI et SZD; 30 km N of Kirşehir, 10 km SE of Akpinar, 154 m, 2006. V. 9., RG; prov. Nevşehir: Kappadokia, Göreme, 1984. V. 16-17., RI; 6 km S of Nevşehir, Çardak Köyü, 1337 m, 2006. V. 8., RG; prov. Eskişehir: Sükrauli Köyü, 1987. V. 29., RI; prov. Çorum: Sekerhacili, 1987. V. 15., RI et RA; Bogazkale, 1987. V. 14-16., RI; prov. Sivas: Ortagöze, 1987. V. 23., RI; prov. Rize: Mts. Rize, Dereköy, 1987. V. 21., RI et RA; prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI et RA, 1990. IV. 6., SZD; prov. Bursa: Demirci, 1989. VI. 14., RI; prov. Erzincan: Basköy, 1989. VI. 7., RI; prov. Siirt: South shore of Van-lake, 1989. VI. 1., RI; prov. Kirklareli: 10 km SE of Kirklareli, Kizilcikdere, 205 m, 2006. V. 11., RG; prov. Burdur: Dinar, 1984. V. 6., SZD; prov. Içel: Mts. Taurus, Yavca, 1984. V. 13., SZD; Mts. Taurus, Çamlyayla, 1984. V. 15., SZD - General distribution: Eurasian species. Occurrence: Wide-spread and frequent.

Onthophagus Latreille, 1802

Onthophagus (Furconthophagus) furcatus (Fabricius, 1781) - prov. Aydin: Umurlu, 1984. V. 4., RI et SZD; prov. Ankara: Pazar, shore of lake, 1984. V. 19., 1987. V. 12., RI et SZD; Yassihöyük, 1987. V. 27., 1989. VI. 11., RI; Kalecik, 1987. V. 13., RI et RA; Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI et RA; prov. Nevşehir: Kappadokia, Kaymakli, 1984. V. 16., RI; Gülşehir, 1984. V. 18., RI; Göreme, 1984. V. 16-17., RI; 6 km S of Nevşehir, Çardak Köyü, 2006. V. 8., RG et RIB; prov. Burdur: Dinar, 1984. V. 6., RI, RAet SZD; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI et SZD; Çardak, 1984. V. 6., RI et RA; prov. Içel: Mts. Taurus, Çamlyayla, 1984. V. 15., RI et SZD; Mts. Taurus, Yavca, 1984. V. 13., RI, RAet SZD; prov. Edirne: Kirçasalih, 1984. V. 1., RI, RA et SZD; Paşayiğit, 1984. V. 1., RI; prov. Kirşehir: Ösbag, 1984. V. 18., RI, RA et SZD; 30 km N of Kirşehir, 10 km SE of Akpinar, 2006. V. 9., RG et RIB; prov. Eskişehir: Oglacki, 1987. V. 28., RI et RA; Çukurca Köyü, 1987. V. 29., RI; Kirka, 1989. VI. 3., RI et RA; Karaağac Köyü, 1989. VI. 12., RI et RA; Sükrani Köyü, 1987. V. 29., RI et RA; prov. Çorum: Sekerhacili, 1987. V. 15., RI; prov. Çorlu: Çorlu, 1987. V. 3., RI; prov. Gümüşhane: Telme, 1987. V. 20., RI; Mts. Gümüşhane, 1600 m, Alucra, 1987. V. 19., RI et RA; prov. Rize: Mts. Rize, Dereköy, 1987. V. 21., RI; prov. Van: Kiziltaş, 1989. VI. 2., RI et RA; prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI, 1990. IV. 6., SZD; Kâhta, Karakus, 1990. IV. 6., SZD; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Bursa: Demirci, 1989. VI. 14., RI; prov. Ağri: Meydandaği, 1989. VI. 3., RI; prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI; prov. Sivas: Kizil Dağ, 1900 m, 1987. V. 23., RI et RA; prov. Siirt: Bank of Kahveci, 1989. V. 31., RI et RA; prov. Tarsus: Gülek, 808 m, 2006. IV. 17., RG et RIB; prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB; Çalislar, 2001. V. 25., RG et RIB; 30 km N of Afyon, Arslantaş, 2001. V. 25., RG et RIB; prov. Çanakkale: Mt. Kavak Dağı, Ayvacik, 2001. V. 13., RG et RIB; Mt. Koru Dağ, Kocaçeşme, 2001. V. 12., RG et RIB; prov. Kütahya: 32 km SE of Keles, Esen, 2001. V. 27., RG et RIB; prov. Antalya: 10 km N of Manavgat, Bucakseyhler, 2001. V. 22., RG et RIB; prov. Balikesir: Kapidağı Yarimadasi, Ballipinar, 2001. V. 31 - VI. 1., RG et RIB; prov. Samsun: Mahmutlu, 700 m, 1996. VII. 8., SZD - General distribution: West-Palearctic species. Occurrence: very wide-spread and common.

Onthophagus (s.str.) illyricus (Scopoli, 1763) - prov. Aydin: Umurlu, 1984. V. 4., prov. Içel: Mts. Taurus, Kerimler, 1984. V. 13., RI et RA; Mts. Taurus, Yavca, 1984. V. 13., SZD; prov. Kirşehir: Ösbag, 1984. V. 18., RI; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Isparta: Asagigökdere, 2001. V. 23., RG; vil Balikesir: Kapidağı Yarimadasi, Ballipinar, 2001. V. 31 . VI. 1., RG et RIB; prov. Muğla: Çukurincir, 2001. V. 21., RG et RIB; 5 km NW of Kargi, Katranci, 2001. V. 18-20., RG et RIB; prov. Kütahya: 32 km SE of Keles, Esen, 2001. V. 27., RG et RIB - General distribution: European-Anatolian species. Occurrence: sporadic and frequent.

Onthophagus (s.str.) taurus (Schreber, 1759) - prov. Ankara: Pazar, shore of lake, 1984. V. 19., 1987. V. 12., RI et RA; prov. Aydin: Umurlu, 1984. V. 4., RI, RA et SZD; prov. Içel: Korykos, 1984. V. 12., RI; Mts. Taurus, Yavca, 1984. V. 13., RI, RA et SZD; prov. Antalya: Side, 1984. V. 9., RI; prov. Kirşehir: Ösbag, 1984. V. 18., RI, RA et SZD; prov. Edirne: Paşayiğit, 1984. V. 1., RI; 20 km SE of Edirne, 109 m, 2006. V. 11., RG et RIB; Çukurköy, 2001. V. 12., RG et RIB; prov. Sakarya: Düzce, 1984. V. 20., RI et RA; Kirkpinar, 1984. V. 20., RI; Esme, 1987. V. 11., RI; prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI; prov. Çorum: Sekerhacili, 1987. V. 15., RI; Bogazkale, 1987. V. 14-16., RI; prov. Çorlu: Marmaracik, 1987. VI. 3., RI; Lüleburgaz, 1987. V. 11., RI et RA; prov. Sivas: 13 km E of Zara, 1987. V. 23., RI; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Bursa: Demirci, 1989. VI. 14., RI; prov. Erzincan: Ganiefendi, Ciftlik Köyü, 200 m, 1996. VI. 27-28., RI; prov. Isparta: Asagigökdere, 2001. V. 23., RG; prov. Balikesir: Kapidağı Yarimadasi, Ballipinar, 2001. V. 31 - VI. 1., RG et RIB; prov. Muğla: Çukurincir, 2001. V. 21., RG et RIB; prov. Kirklareli: 10 km SE of Kirklareli, Cizilcikdere, 205 m, 2006. V. 11., RG et RIB; prov. Afyon: 30 km N of Afyon, Arslantaş, 2001. V. 25., RG et RIB; prov. Kütahya: 32 km SE of Keles, Esen, 2001. V. 27., RG et RIB; prov. Tekirdağ: 10 km

N of Çerkezköy, 158 m, 2006. V. 11., RG; prov. Diyarbakir: Alipaşa, 1990. IV. 9., SZD; prov. Gaziantep: Gaziantep, 1990. IV. 5., SZD - General distribution: Palearctic species. Occurrence: very wide-spread and common.

Onthophagus (Palaeonthophagus) cruciatus Ménétriés, 1832 - prov. Burdur: Dinar, 1984. V. 6., RI et RA; prov. Ankara: Keskin, 1984. V. 18., RI; prov. Çorum: Sekerhecili, 1987. V. 15., RI; prov. Van: Kiziltaş, 1989. VI. 2., RI - General distribution: East-Mediterranean-Caucasian species. Occurrence: sporadic and not frequent.

Onthophagus (Palaeonthophagus) ruficapillus Brullé, 1832 - prov. Burdur: Dinar, 1984. V. 6., RI, RA et SZD; prov. Aydin: Umurlu, 1984. V. 4., RI, RA et SZD; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI, RA et SZD; prov. Tekirdağ: Muratli, 1984. V. 23., RI; Saray, 172 m, 2006. V. 11., RG et RIB; prov. Içel: Mts. Taurus, Yavca, 1984. V. 13., RI, et SZD; Mts. Taurus, Kerimler, 1984. V. 13., RI et RA; Anamur, 1984. V. 11., RI; Mts. Taurus, Çamlyayla, 1984. V. 15., SZD; prov. Sakarya: Kirkpinar, 1984. V. 20., RI; Esme, 1987. V. 11., RI et RA; prov. Edirne: Kirçasalih, 1984. V. 1., RI; Çukurköy, 2001. V. 12., RG et RIB; prov. Kirşehir: Ösbag, 1984. V. 18., RI, RA et SZD; 30 km N of Kirşehir, 1154 m, 2006. V. 9., RG et RIB; prov. Ankara: Akyarma-pass, 1500 m, bank of Aktas-river, 1987. V. 12., RI; Yassihöyük, 1987. V. 27., 1989. VI. 11., RI; prov. Amasya: Suluova, 1987. V. 16., RI; prov. Çorum: Alacahöyük, 1987. V. 15., RI; Bogazkale, 1987. V. 14-16., RI et RA; prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI; prov. Eskişehir: Kümbet, 1987. V. 30., RI; Seyitgazi, 2001. V. 26., RG et RIB; prov. Çorlu: Marmaracik, 1987. VI. 3., RI; Lüleburgaz, 1987. V. 11., RI et RA; prov. Sivas: Salur, 1987. V. 23., RI; 13 km E of Zara, 1987. V. 23., RI et RA; Ortagöze, 1987. V. 23., RI; prov. Erzurum: Egerti, 1987. V. 22., RI; prov. Yozgat: Derbent, 1989. VI. 10., RI; prov. Adana: Kabasakal, 1990. IV. 3., SZD; prov. Samsun: Mahmutlu, 700 m, 1996. VII. 8., SZD; prov. Muğla: Köyceğiz, 2001. V. 18., RG et RIB; prov. Izmir: Zeytindağ, 2001. V. 14., RG et RIB; prov. Çanakkale: Mts. Koru Dağ, Kocaçeşme, 2001. V. 12., RG et RIB; prov. Nevşehir: 6 km S of Nevşehir, Çardak Köyü, 1337 m, 2006. V. 8., RG et RIB; prov. Kütahya: Yoncali, 2001. V. 27., RG et RIB; prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB; Çalislar, 2001. V. 25., RG et RIB; prov. Kirklareli: 10 km SE of Kirklareli, Kizilcikdere, 205 m, 2006. V. 11., RG et RIB; prov. Tarsus: Gülek, 808 m, 2006. IV. 17., RG et RIB; 50 km N of Tarsus, 5 km N of Gülek, 1329 m, 2006. V. 7., RG et RIB; prov. Balikesir: Kapidaği Yarimadasi, Ballipinar, 2001. V. 31 - VI. 1.; RG et RIB; prov. Isparta: Asagigökdere, 2001. V. 23., RG et RIB - General distribution: European-Anatolian species. Occurrence: very wide-spread and common.

Onthophagus (Palaeonthophagus) coenobita (Herbst, 1783) - prov. Erzurum: Mts. Rize, Ispir, 1987. V. 21., RI - European-Turanian species. Occurrence: sporadic and rare.

Onthophagus (Palaeonthophagus) fissicornis Steven, 1809 - prov. Çorlu: Marmaracik, 1987. VI. 3., RI; prov. Eskişehir: Yazilikaya, 1987. V. 29., RI; Yazilikaya, Midas Şehri, 2001. V. 26., RG; Kirka, 1989. VI. 13., RI; prov. Içel: Mts. Taurus, Çamliayla, 1984. V. 15., RI et SZD; Mts. Taurus, Yavca, 1984. V. 13., RI et SZD; Mts. Taurus, Kerimler, 1984. V. 13., RI et RA; Mts. Taurus, Aladağ, 1984. V. 13., RI; prov. Burdur: Dinar, 1984. V. 6., RI, RA et SZD; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI, RA et SZD; prov. Izmir: Bergama, Pergamon, 1984. V. 3., RI et SZD, 1989. V. 23., RI; Zeytindağ, 2001. V. 14., RG et RIB; prov. Kirşehir: Ösbag, 1984. V. 18., RI et SZD; prov. Edirne: Paşayiğit, 1984. V. 1., RI et RA; Çukurköy, 2001. V. 12., RG et RIB; prov. Ankara: Pazar, shore of lake, 1984. V. 19., 1987. V. 12., RI; prov. Gümüşhane: Telme, 1987. V. 20., RI; prov. Sivas: Kizilli, 1987. V. 24., RI; prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI, 1990. IV. 6., SZD; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Isparta: Boyali, Eğridir Gölü, 2001. V. 24., RG; prov. Kütahya: 32 km SE of Keles, Esen, 2001. V. 27., RG et RIBYoncali, 2001. V. 27., RG et RIB; prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB; Ayazini, 1990. IV. 18., SZD; prov. Çanakkale: Mt. Kavak Dağı, Ayvacik, 2001. V. 13., RG et RIB; Mt. Koru Dağ, Kocaçeşme, 2001. V. 12., RG et RIB; prov. Bursa: Bursa, Mts. Ulu Dağ, 1200 m, 2001. V. 28., RG et RIB; prov. Antalya: 10 km N of Manavgat, Bucakseyhler, 2001. V. 22., RG et RIB; prov. Tekirdağ: Saray, 172 m, 2006. V. 11., RG et RIB; prov. Tarsus: Gülek, 808 m, 2006. IV. 17., RG et RIB; prov. Balikesir: Kapidaği Yarimadasi, Çakilköy, 2001. VI. 1., RG et RIB; prov. Adana: Kabasakal, 1990. IV. 3., SZD - General ditribution: East-Mediterranean species. Occurrence: very wide-spread and common.

Onthophagus (Palaeonthophagus) fissinasus Fairmaire, 1895 - prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB - General distribution: East-Mediterranean species. Occurrence: sporadic and very rare.

Onthophagus (Palaeonthophagus) fracticornis (Preyssler, 1790) - prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI; prov. Içel: Mts. Taurus, Çamlyayla, 1984. V. 15., RI; Mts. Taurus, Yavca, 1984. V. 13., RI; prov. Ankara: Akyarma-pass, 1500 m, bank of Aktas-river, 1987. V. 12., RI et RA; prov. Eskişehir: Sükrauli Köyü, 1987. V. 29., RI; Kümbet, 1987. V. 30., RI; prov. Erzincan: Basköy, 1989. VI. 7., RI; Mts. Keşiş, Derekorosu,

1989. VI. 7., RI; prov. Kars: Mts. Ararat, 1989. VI. 4., RI; prov. Antalya: 10 km N of Manavgat, Bucakseyhler, 2001. V. 22., RG et RIB; prov. Balikesir: Kapidaği Yarimadasi, Çakilköy, 2001. VI. 1., RG et RIB; prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB; prov. Isparta: Asagigökdere, 2001. V. 23., RG et RIB; prov. Muğla: Çukurincir, 2001. V. 21., RG et RIB - General distribution: West-Palearctic species. Occurrence: wide-spread and frequent.

Onthophagus (Palaeonthophagus) furciceps Marseul, 1869 - prov. Burdur: Dinar, 1984. V. 6., RI - General distribution: Pontomediterranean species. Occurrence: wide-spread and rare.

Onthophagus (Palaeonthophagus) gibbulus (Pallas, 1781) - prov. Giresun: Eğribel pass, 2200 m, 1996. VII. 6., SZD - General distribution: Eurasian species. Occurrence: sporadic and rare.

Onthophagus (Palaeonthophagus) lemur (Fabricius, 1781) - prov. Içel: Mts. Taurus, 1984. V. 13., RI; Mts. Taurus, Yavca, 1984. V. 13., SZD; prov. Sivas: Kizil Dağ, 1900 m, 1987. V. 23., RI et RA; prov. Eskişehir: Sükrauli Köyü, 1987. V. 29., RI; Yazilikaya, 1987. V. 29., RI; prov. Giresun: Şebinkarahisar, 1987. V. 19., RI; prov. Rize: Mts. Rize, Dereköy, 1987. V. 21., RI; prov. Erzincan: Basköy, 1989. VI. 7., RI; prov. Muğla: Köycegiz, 2001. V. 18., RG et RIB - General distribution: European-Anatolian species. Occurrence: wide-spread, but not frequent.

Onthophagus (Palaeonthophagus) lucidus (Sturm, 1800) - prov. Içel: Mts. Taurus, Çamlyayla, 1984. V. 15., RI; Mts. Taurus, Kerimler, 1984. V. 13., RI et RA; prov. Burdur: Dinar, 1984. V. 6., RI et RA; prov. Kirşehir: Ösbag, 1984. V. 18., RI, RA et SZD; 30 km N of Kirşehir, 10 km S of Akpinar, 1154 m, 2006. V. 9., RG et RIB; prov. Ankara: Keskin, 1984. V. 18., RI; Uzzettin, 30 km E of Kirikkale, 1987. V. 13., RI et RA; Polatli, 1987. V. 27., RI; Yassihöyük, 1987. V. 27., 1989. VI. 11., RI et RA; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI; prov. Gümüşhane: Telme, 1987. V. 20., RI; prov. Sivas: 13 km E of Zara, 1987. V. 23., RI et RA; Salur, 1987. V. 23., RI; Ortagöze, 1987. V. 23., RI; prov. Erzurum: Askale, 1987. V. 22., RI; prov. Eskişehir: Kirka, 1989. VI. 13., RI; prov. Kars: Mts. Ararat, 1989. VI. 4., RI; prov. Van: Kiziltaş, 1989. VI. 2., RI; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB; Çalislar, 2001. V. 25., RG et RIB - General distribution: Pontomediterranean species. Occurrence: wide-spread and frequent.

Onthophagus (Palaeonthophagus) marginalis Gebler, 1817 - prov. Ankara: Yassihöyük, 1989. VI. 11., RI; Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI; prov. Van: Kayabogaz, 1989. VI. 1., RI; prov. Eskişehir: Kirka, 1989. VI. 13., RI et RA; Sükrauli Köyü, 1987. V. 29., RI; Seyitgazi, 2001. V. 26., RG et RIB; prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI et RA; prov. Izmir: Bergama, Pergamon, 1984. V. 3., RI et SZD; NE of Zeytindağ, Koyuneli, 2001. V. 14., RG et RIB; prov. Burdur: Dinar, 1984. V. 6., RI, RA et SZD; prov. Kirşehir: Ösbag, 1984. V. 18., RI; 30 km N of Kirşehir, 10 km SE of Akpinar, 1154 m, 2006. V. 9., RG et RIB; prov. Çorum: Sekerhacili, 1987. V. 15., RI; Bogazkale, 1987. V. 14-16., RI; prov. Sivas: Ortagöze, 1987. V. 23., RI et RA; prov. Rize: Mts. Rize, Dereköy, 1987. V. 21., RI; prov. Kütahya: Yoncali, 2001. V. 27., RG et RIB; prov. Çanakkale: Ezine, 1984. V. 2., SZD - General distribution: Eurasian species. Occurrence: wide-spread and frequent.

Onthophagus (Palaeonthophagus) opacicollis Reitter, 1893 - prov. Balikesir: Kapidaği Yarimadasi, Cakilköy, 2001. VI. 1., RG et RIB; prov. Eskişehir: Yazilikaya, Midas Şehri, 2001. V. 26., RG - General distribution: Circummediterranean species. Occurrence: sporadic, not frequent.

Onthophagus (Palaeonthophagus) osellai Pittino, 1982 - prov. Kars: Mts. Ararat, 1989. VI. 4., RI; prov. Erzincan: Basköy, 1989. VI. 7., RI et RA; prov. Burdur: Dinar, 1984. V. 6., SZD; prov. Içel: Mts. Taurus, Yavca, 1984. V. 13., SZD; Mts. Taurus, Çamlyayla, 1984. V. 15., SZD; prov. Adiyaman: Nemrut Dağı, 1990. IV. 6., SZD; prov. Erzurum: Erzurum, 1990. IV. 13., SZD - General distribution: Caucasian species. Occurrence: sporadic, rare.

Onthophagus (Palaeonthophagus) ponticus Harold, 1883 - prov. Eskişehir: Oglacki, 1987. V. 28., RI; prov. Nevşehir: 6 km S of Nevşehir, Çardak Köyü, 1337 m, 2006. V. 8., RG et RIB - General distribution: Pontic species. Occurrence: sporadic, rare.

Onthophagus (Palaeonthophagus) rostrifer Reitter, 1893 - prov. Erzincan: Mts. Keşiş, Derekorosu, 1989. VI. 7., RI et RA; Basköy, 1989. VI. 7., RI et RA; prov. Sivas: Kizil Dağ, 1900 m, 1987. V. 23., RI; prov. Erzurum: Egerti, 1987. V. 22., RI; prov. Kars: Mts. Ararat, 1989. VI. 4., RI et RA - General distribution: Caucasian species. This is wide-spread in the mointainous district of East-Turkey, not frequent.

Onthophagus (Palaeonthophagus) sericatus Reitter, 1893 - prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI et RA; prov. Içel: Mts. Taurus, Kerimler, 1984. V. 13., RI; Mts. Taurus, Çamlyayla, 1984. V. 15., SZD; prov. Çorum: Bogazkale, 1987. V. 14-16., RI et RA; prov. Ankara: Pazar, 1987. V. 12., RI; prov. Eskişehir: Sükrauli Köyü, 1987. V. 29., RI; prov. Sakarya: Esme, 1987. V. 11., RI; prov. Siirt: Sapur, Dinlerme

Yeri, 1989. VI. 1., RI - General distribution: Balkan-Asianic species. Occurrence: wide-spread, but not frequent.

Onthophagus (Palaeonthophagus) similis (Scriba, 1790) - prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI, RA et SZD; prov. Içel: Anamur, 1984. V. 11., RI; Virenşehir, 1984. V. 13., SZD; prov. Tarsus: Gülek, 808 m, 2006. IV. 17., RG et RIB; prov. Antalya: Aksu, Perge, 1984. V. 8., SZD - General distribution: West-Palearctic species. This is a new record for Turkey.

Onthophagus (Palaeonthophagus) suturellus Brullé, 1832 - prov. Nevşehir: Kappadokia, Göreme, 1984. V. 16-17., RI; prov. Kirşehir: Ösbag, 1984. V. 18., RI et RA; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI et SZD; prov. Sivas: Kizil Dağ, 1900 m, 1987. V. 23., RI; Ortagöze, 1987. V. 23., RI; prov. Adiyaman: Mt. Nemrut, 1800 m, 1989. V. 29., RI, 1990. IV. 6., SZD; prov. Gaziantep: Gaziantep, 1990. IV. 15., OA; vil Eskişehir: Seyitgazi, 2001. V. 26., RG et RIB; prov. Kütahya: Yoncali, 2001. V. 27., RG et RIB; prov. Burdur: Dinar, 1984. V. 6., SZD; prov. Siirt: Silvan, 1990. IV. 9., SZD - General distribution: Pontomediterranean species. Occurrence: wide-spread and frequent.

Onthophagus (Palaeonthophagus) tesquorum Semenov et Medvedev, 1929 - prov. Kirşehir: Ösbağ, 1984. V. 18., SZD; prov. Erzurum: Erzurum, 1990. IV. 13., SZD - General distribution: Pontomediterranean species. This is a new record for Turkey.

Onthophagus (Palaeonthophagus) truchmenus Kolenati, 1846 - prov. Rize: Mts. Rize, Dereköy, 1987. V. 21., RI; prov. Kirşehir: Ösbag, 1984. V. 18., RI; prov. Çorum: Sekerhacili, 1987. V. 15., RI; Bogazkale, 1987. V. 14-16., RI; prov. Sivas: 13 km E of Zara, 1987. V. 23., RI; Ortagöze, 1987. V. 23., RI; prov. Erzurum: Askale, 1987. V. 22., RI; Egerti, 1987. V. 22., RI; prov. Siirt: Sapur, Dinlerme Yeri, 1989. VI. 1., RI et RA; prov. Ağri: Meydandağı, 1989. VI 3., RI - General distribution: East-Mediterranean-Caucasian species. Occurrence: wide-spread and frequent.

Onthophagus (Palaeonthophagus) vacca (Linnaeus, 1767) - prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI et SZD; prov. Izmir: Bergama, Pergamon, 1984. V. 3., RI; prov. Edirne: Paşayiğit, 1984. V. 1., RI; prov. Aydin: Ortaklar, 1984. V. 4., RI; Umurlu, 1984. V. 4., RI et SZD; prov. Kirşehir: Ösbag, 1984. V. 18., RI et SZD; prov. Çorum: Sekerhacili, 1987. V. 15., RI et RA; prov. Gümüşhane: Siran, 1987. V. 20., RI; prov. Eskişehir: Sükrauli Köyü, 1987. V. 29., RI; Kümbet, 1987. V. 30., RI; Kirka, 1989. VI. 13., RI; prov. Ankara: Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI; prov. Sivas: Kizil Dağ, 1900 m, 1987. V. 23., RI; 13 km E of Zara, 1987. V. 23., RI; prov. Çorlu: Lüleburgaz, 1987. V. 11., RI; prov. Kars: Mts. Ararat, 1989. VI. 4., RI et RA; prov. Erzincan: Basköy, 1989. VI. 7., RI; prov. Bursa: Ulu Dağ, 1989. VI. 14., RI; 2001. V. 28., RG et RIB; prov. Ağri: Meydandağı, 1989. VI. 3., RI; prov. Afyon: Arslantaş, 30 km N of Afyon, 2001. V. 25., RG et RIB; Çayirbağ, 2001. V. 25., RG et RIB; Çobankaya, 2001. V. 24., RG et RIB; prov. Balikesir: Kapidağı Yarimadasi, Çakilköy, 2001. VI. 1., RG et RIB; Kapidağı Yarimadasi, Çayagzi, 2001. VI. 1., RG et RIB; Kapidağı Yarimadasi, Ballipinar, 2001. V. 31 - VI. 1., RG et RIB; prov. Kütahya: 32 km SE of Keles, Esen, 2001. V. 27., RG et RIB; prov. Tekirdağ: Inecik, 2001. VI. 5., RG et RIB; prov. Çanakkale: Mt. Koru Dağ, Kocaçeşme, 2001. V. 12., RG et RIB; prov. Antalya: Aksu, Perge, 1984. V. 8., SZD - General distribution: Circummediterranean species. Occurrence: wide-spread and common.

Onthophagus (Palaeonthophagus) verticicornis (Laicharting, 1781) - prov. Eskişehir: Kümbet, 1987. V. 30., RI; prov. Isparta: Boyali, Eğirdir Gölü, 2001. V. 24., RG; prov. Izmir: Bergama, 1989. V. 23., RI; prov. Kirklareli: 10 km SE of Kirklareli, Kizilcikdere, 205 m, 2006. V. 11., RG et RIB; prov. Afyon: Çobankaya, 2001. V. 24., RG et RIB - General distribution: European-Turanian species. Occurrence: wide-spread,but not frequent.

Onthophagus (Palaeonthophagus) vitulus (Fabricius, 1776) - prov. Nevşehir: Kappadokia, Kaymakli, 1984. V. 16., RI et SZD; prov. Ankara: Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI; Yassihöyük, 1987. V. 27., RI; prov. Eskişehir: Oglacki, 1987. V. 28., RI; prov. Kirşehir: 30 km N of Kirşehir, 10 km SE of Akpinar, 1154 m, 2006. V. 9., RG et RIB; prov. Kirklareli: 10 km SE of Kirklareli, Kizilcikdere, 205 m, 2006. V. 11., RG et RIB; prov. Kayseri: Yeşilhisar, 1990. IV. 15., SZD - General distribution: European-Siberian species. Occurrence: sporadic, not frequens.

Galphyridae

Amphicoma Latreille, 1807

Amphicoma ciliata (Ménétriés, 1836) - prov. Erzincan: Tercan, 1500 m, 1996. VI. 28., SZD - General distribution: Asianic endemic species. Occurrence: very rare.

Eulasia Truqui, 1848

Eulasia arctos arctos (Pallas, 1781) - prov. Içel: Mersin, 1984. V. 12., SZD - General distribution: Balkan-Caucasian subspecies. This is a new record for Turkey.

Eulasia (s.str.) arctos anatolica Reitter, 1903 - prov. Yozgat: Derbent, 1989. VI 10., RI - General distribution: This subspecies lives in West-Anatolia.. Occurrence: rare. TN: *Sinapis-, Medicago-, Vicia-, Onopordum-, Euphorbia*-spp.

Eulasia (s.str.) arctos armeniaca (Reitter, 1890) - prov. Adana: Mts. Aladağ, Kizilcahaman, 1400 m, 1983. VI. 19-21., GK; prov. Adiyaman: Mt. Nemrut, 1989. V. 30., RI; prov. Ankara: Çamlidere pass, 1300 m, 1996. VI. 25., SZD - General distribution: Caucasian subspecies. Occurrence: it is found in East-Anatolia, frequent. TN: *Sinapis-, Medicago-, Vicia-, Onopordum-, Euphorbia*-spp.

Eulasia (s.str.) arctos martes (Frivaldszky, 1845) - prov. Yozgat: Derbent, 1989. VI. 10., RI et RA; prov. Bursa: Mts. Ulu Dağ, 1200 m, Sogukpinar, 2001. VI. 10., RG; prov. Bilecik: 10 km S of Bözüyük, Daridere, 2001. V. 26., RG et RIB; prov. Ankara: Çamlidere pass, 1300 m, 1996. VI. 25., SZD. - General distribution: Balkan-Anatolian subspecies. Occurrence: it is found in West-Anatolia, frequent. TN: *Sinapis-, Medicago-, Vicia-, Onopordum-, Euphorbia*-spp.

Eulasia (s.str.) bicolor bicolor (Waltl, 1838) - prov. Aydin: Ortaklar, 1984. V. 4., RI; prov. Ankara: Çamlidere, 1200 m, RI et RA; prov. Ağri: Mts. Karasu-Aras, 7 km E of Aydintepe, 2000. VII. 4., SZK; prov. Kirklareli: 10 km SE of Kirklareli, 250 m, Kizilcikdere, 2008. V. 11., RG et RIB; prov. Manisa: Sartmustafa, Sardes, 2001. V. 15., RG et RIB; 13 km N of Muradiye, Avdal, 2001. V. 15., RG et RIB; prov. Izmir: Mts. Boz Dağlari, Bozdağ, 2001. V. 15., RG et RIB; prov. Artvin: Savsat, 1000 m, 1996. VI. 29., SZD; prov. Erzurum: Aksu, 1650 m, 1996. VI. 28., SZD - General distribution: Anatolian subspecies. Occurrence: wide-spread and frequent.

Eulasia (s.str.) bicolor dichroa (Reitter, 1890) - prov. Kirklareli: 20 km SE of Kirklareli, Kizilcikdere, 205 m, 2006. V. 11., RG - General distribution: Balkan subspecies. Occurrence: It is found in European Turkey, rare.

Eulasia (s.str.) bombyliformis bombyliformis (Pallas, 1781) - prov. Siirt: Köprücek, 1989. V. 1., RI; Kusgunkiran-pass, 1989. VI. 1., RI et RA; prov. Adiyaman: Mt. Nemrut, 1800 m, RI et RA; prov. Içel: Mts. Taurus, 1600 m, Çamlyayla, 1989. V. 27., RI; Mts. Ala Dağ, Kizilcahaman, 1400m, 1983. VI. 19-21., GK - General distribution: Caucasian-Turanian species. Occurrence: sporadic and frequent. TN: *Sinapis-, Onopordum-, Rosa-, Anthemis-, Euphorbia*-spp.

Eulasia (s.str.) chrysopyga (Faldermann, 1835) - prov. Erzurum: Tortum, 1996. VI. 28., RI; prov. Ağri: Tahir, Agilli-pass, 2000. VI. 12., RG; prov. Artvin: Yalnizçam pass, 2000 m, 1996. VII. 1., SZD; prov. Ankara: Çamlidere pass, 1300 m, 1996. VI. 25., SZD; prov. Erzurum: Aksu, 1650 m, 1996. VI. 28., SZD - General distribution: Caucasian species. Occurrence: It is found in Anatolia, but rare.

Eulasia (s.str.) cornifrons Reitter, 1903 - prov. Içel: Mts. Taurus, 700 m, 8 km N of Erdemli, 2004. VI. 2., SZK et RN - General distribution: Endemic species is in South-Turkey. Occurrence: very rare. TN: *Papaver rhoeas, Sinapis-, Rosa-, Onopordum-, Euphorbia-, Triticum*-spp.

Eulasia (s.str.) diadema (Reitter, 1890) - prov. Antalya: Aksu, Perge, 1984. V. 8., RI; Güney, 1984. V. 10., RI, RA et SZD; Payallar, 1984. V. 9., RI; Kalediran, 1984. V. 10., RI et RA; Side, 1984. V. 9., RI; Antalya, 1984. V. 10., SZD; prov. Içel: Anamur, 1984. V. 11., RI, RA et SZD; prov. Isparta: 15 km N of Sütçüler, Sipahiler, 2001. V. 23., RG et RIB; Elsazi, 2001. V. 23., RG et RIB; prov. Muğla: 10 km E of Kas, 2001. V. 21., RG et RIB; Boncuk Dağı, Üzümlü, 2001. V. 19., RG et RIB; prov. Denizli: 5 km W of Tavas, Keceliler, 2001. V. 17., RG et RIB; prov. Antalya: 10 km N of Manavgat, Bucakseyhler, 2001. V. 22., RG et RIB - General distribution: Anatolian species. Occurrence: wide-spread, but not frequent.

Eulasia (s.str.) korbi (Petrovitz, 1972) - prov. Kars: Mts. Karasu-Aras, bank of Aras river, 1989. VI. 5., RI et RA - General distribution: Caucasian species. This is a new record for Turkey.

Eulasia (s.str.) nitidicollis (Reiche, 1862) - prov. Antalya: Kalediran, 1984. V. 10., RI et RA; prov. Içel: Mts. Taurus, Aladağ, 1984. V. 13., SZD - General distribution: East-Mediterranean species. Occurrence: sporadic and rare.

Eulasia (s.str.) praeusta clypealis Petrovitz, 1972 - prov. Sivas: Gürün, 1500 m, 1989. V. 6-8., SC - General distribution: Anatolian subspecies. Occurrence: sporadic and rare.

Eulasia (Rudeulasia) anemurensis (Petrovitz, 1964) - prov. Antalya: Aksu, Perge, 1984. V. 8., RI - General distribution: Endemic species is in South-Turkey. Occurrence: rare.

Eulasia (Rudeulasia) chalybaea brenskei Reitter, 1890 - prov. Van: Banbimaki, 1989. VI. 3., RI et RA - General distribution: East-Turkey subspecies. Occurrence: rare.

Eulasia (Rudeulasia) eiselti (Petrovitz, 1967) - prov. Muğla: Boncuk Dağı, Üzümlü, 2001. V. 19., RG et RIB - General distribution: Endemic species is in West- and South- Anatolia. Occurrence: rare. TN: *Papaver*-spp.

Eulasia (Rudeulasia) harmonia (Petrovitz, 1962) - prov. Antalya: Aksu, Perge, 1984. V. 8., RI, RA et SZD; prov. Içel: Mts. Taurus, Aladağ, 1984. V. 13., RI et SZD - General distribution: Endemic species is in South-Turkey. Occurrence: not frequent.

Eulasia (Rudeulasia) hybrida (Reitter, 1890) - vil Van: Bandimaki, 1984. VI. 2., RI et RA -General distribution: Endemic species is in East-Turkey. Occurrence: rare.

Eulasia (Rudeulasia) papaveris (Sturm, 1843) - prov. Içel: Mts. Taurus, Ulaş, 1984. V. 14., RI et SZD; Mts. Taurus, 900 m, 5 km S of Güzeloluk, 2004. VI. 2., RN et SZK; Namrun, Çamlyayla, 1400 m, 1983. VI. 24-30, GK - General distribution: East-Maditerranean species. Occurrence: wide-spread and frequent. TN: *Papaveris rhoeas, Centaurea-, Rosa-, Rubus-, Anthemis-, Onopordum*-spp.

Eulasia (Rudeulasia) pulchra (Reitter, 1890) - prov. Içel: Sarikavak, 1989. V. 27., RI et RA -General distribution: Caucasian-Anatolian species. Occurrence: sporadic and not frequent.

Eulasia (Rudeulasia) speciosa (Champenois, 1900) - prov. Içel: Camalan, 702 m, 2006. IV. 17., RG - General distribution: East-Mediterranean species. Occurrence: sporadic and not frequent.

Eulasia (Vittateulasia) pareyssei (Brullé, 1832) (= *lasserrei* Germar, 1834) - prov. Izmir: Selçuk, Ephesos, 1984. V. 4., RI, RA et SZD; Bergama, Pergamon, 1984. V. 3., RI, RA et SZD; prov. Aydin: Ortaklar, 1984. V. 4., RI, RA et SZD; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI et RA; Bergama, 2001. V. 14., RG et RIB; prov. Tekirdağ: 10 km N of Çekerköy, 158 m, 2006. VI. 11., RG et RIB; prov. Manisa: 5 km SE of Manisa, 2001. V. 15., RG et RIB; prov. Balikesir: Kapidaği Yarimadasi, Ocaklar, 2001. VI. 2., RG et RIB; prov. Kirklareli: 10 km SE of Kirklareli, Kizilcikdere, 205 m, 2006. V. 11., RG - General distribution: Balkan-Anatolian species. Occurrence: it is found in the European-Turkey and West-Anatolia, frequent.

Eulasia (Vittateulesia) vittata vittata (Fabricius, 1775) - prov. Uşak: Banaz, 1989. V. 24., RI; prov. Balikesir: Ulukir, 1989. VI. 15., RI et RA; Mt. Kapi Dağ, 400 m, Ocaklar, 2001. V. 30., RG; Kapidaği Yarimadasi, Çakilköy, 2001. VI. 1., RG et RIB; Kapidaği Yarimadasi, Ocaklar, 2001. VI. 2., RG et RIB; Dari Kum, 2001. V. 30., RG et RIB; prov. Izmir: Bergama, Pergamon, 1989. V. 23., RI; prov. Denizli: Pamukkale, 2001. V. 16-17., RG; 3 km N of Buldan, 2001. V. 16., RG et RIB; prov. Muğla: Esen, 2001. V. 21., RG et RIB; prov. Manisa: Sartmustafa, Sardes, 2001. V. 15., RG et RIB - General distribution: Balkan-Anatolian subspecies. Occurrence: it is found in the European-Turkey and West-Anatolia. Occurrence: wide-spread and frequent. TN: *Papaver rhoeas, Onopordum-, Triticum-, Cistus-, Helianthus-, Quercus-, Cirsium-, Echinops*-spp.

Eulasia (Vittateulasia) vittata lineata (Faldermann, 1835) - prov. Içel: Anamur, 1984. V. 11., RI, RA et SZD; Mts. Taurus, Namrun, Çamlyayla, 1400 m, 1983. VI. 24-30., GK; prov. Siirt: Bank of Kahveci, 1989. V. 31., RI et RA; Çayhan, 1989. V. 31., RI et RA - General distribution: East-Mediterranean subspecies. Occurrence: frequent in South-Turkey. TN: *Papaver rhoeas, Onopordum-, Triticum-, Cistus-, Helianthus-, Quercus-, Cirsium-, Echinop*s-spp.

Glaphyrus Latreille, 1807

Glaphyrus festivus Ménétriés, 1836 - prov. Erzincan: Tercan, 1500 m, 1996. VI. 28., RI et SZD - General distribution: Caucasian-Anatolian species. Occurrence: frequent. TN: *Onopordum*-spp.

Glaphyrus micans Faldermann, 1835 - prov. Siirt: Çayhan, 1989. V. 31., RI - General distribution: Caucasian species. Occurrence: sporadic and rare.

Glaphyrus varians Ménétriés, 1836 - vil Siirt: Çayhan, 1989. V. 31., RI; prov. Çorum: Büyükincesu, 800 m, 1996. VI. 26., SZD; prov. Denizli: Pamukkale, 2001. V. 16-17., RG et RIB - General distribution: Caucasian-Anatolian species. Occurrence: sporadic and frequent.

Pygopleurus Motschulsky, 1859

Pygopleurus anemoninus (Brullé, 1832) - prov. Manisa: Sartmustafa, Sardes, 2001. V. 16., RG; prov. Muğla: 10 km E of Muğla, Kötekli, 2001. V. 17., RG et RIB - General distribution: Caucasian-Anatolian species. Occurrence: sporadic, not frequent.

Pygopleurus diffusus (Petrovitz, 1957) - prov. Izmir: Bergama, Pergamon, 1984. V. 3., 2001. V. 14., RI et RA et RG; Selçuk, Ephesos, 1984. V. 4., RI et RA; prov. Siirt: Köprücek, 1989. V. 1., RI; prov. Antalya: Aksu, Perge, 1984. V. 8., RI et RA; Güney, 1984. V. 10., RI; prov. Muğla: 10 km E of Muğla, Kötekli, 2001. V. 17., RG et RIB; prov. Aydin: Ortaklar, 1984. V. 4., RI; prov. Içel: Sarikavak, 1989. V. 27., RI; prov. Ankara: Polatli, 1987. V. 27., RI et RA; prov. Tekirdağ: 10 km N of Cerkezköy, 158 m, 2001. VI. 5., RG et RIB; prov. Isparta: 15 km N of Sütcüler, Sipahiler, 2001. V. 21., RG et RIB; prov. Denizli: 5 km W of Tavan, Keceliler, 2001. V.

17., RG et RIB - General distribution: Balkan-Anatolian species. Occurrence: wide-spread and frequent.

Pygopleurus foina (Reitter, 1890) - prov. Izmir: Selçuk, Ephesos, 1984. V. 4., RI et RA; Bergama, Pergamon, 1984. V. 3., RI et RA; Bergama, Pergamon, 2001. V. 14., RG; prov. Aydin: Ortaklar, 1984. V. 4., RI et RA; prov. Niğde: Niğde, 1984. V. 16., RI; 30 km S of Niğde, 15 km N of Ulukisla, 2006. V. 8., RG et RIB; prov. Yozgat: Derbent, 1989. VI. 10., RI; prov. Antalya: Aksu. Perge, 1984. V. 8., RI; prov. Eskişehir: Seyitgazi, 1984. V. 29., RI; Yazilikaya, Midas Şehri, 2001. V. 26., RG et RIB; prov. Afyon: 15 km NE of Afyon, Atlihisar, 2001. V. 24., RG; prov. Manisa: Sartmustafa, Sardes, 2001. V. 15., RG et RIB; 5 km SE of Manisa, 2001. V. 15., RG et RIB; prov. Denizli: 3 km N of Buldan, 2001. V. 16., RG; 5 km W of Tavan, Keceliler, 2001. V. 17., RG et RIB; Pamukkale, 2001. V. 16-17., RG et RIB; prov. Kirklareli: 10 km SE of Kirklareli, Kizilcikdere, 205 m, 2006. V. 11., RG et RIB; 20 km SE of Kirklareli, 240 m, 2006. V. 11., RG et RIB; 20 km W of Vize, Erenzer, 261 m, 2006. V. 11., RG et RIB; prov. Muğla: 10 km E of Muğla, Kötekli, 2001. V. 17., RG et RIB; Kizilyaka, 2001. V. 17., RG et RIB; prov. Bursa: Mts. Ulu Dağ, Sogukpinar, 1200 m, 2001. V. 28., RG et RIB; prov. Çanakkale: Truva (Troja), 2001. V. 13., RG et RIB; Gelibolu Yarimadasi, Bayirköy, 2001. V. 12., RG et RIB; 5 km S of Ayvacik, 2001. V. 14., RG et RIB - General distribution: Anatolian species. Occurrence: wide-spread and common. TN: *Papaver rhoeas, Sinapis-, Anthemis*-spp.

Pygopleurus hirsutus (Brullé, 1839) - prov. Bilecik: 10 km S of Bözüyük, Daridere, 2001. V. 26., RG et RIB; prov. Manisa: 13 km N of Muradiye, Avdal, 2001. V. 15., RG; prov. Muğla: Boncuk Dağı, Üzümlü, 2001. V. 19., RG et RIB - General distribution: Balkan-Anatolian species. Occurrence: wide-spread and frequent in West-Anatolia.

Pygopleurus humeralis (Brullé, 1832) - prov. Tekirdağ: 10 km N of Cerkezköy, 158 m, 2001. VI. 5., RG et RIB - General distribution: European-Anatolian species. Occurrence: frequent in the European-Turkey.

Pygopleurus koniae (Petrovitz, 1957) - prov. Gümüşhane: Siran, 1987. V. 20., RI et RA; prov. Sivas: Sandal, 1987. V. 24., RI - General distribution: Endemic species in Anatolia. 1 specimen known to Teheran (Iran). Occurrence: sporadic and rare.

Pygopleurus labaumei (Petrovitz, 1971) - prov. Izmir: Bergama, Pergamon, 1984. V. 3., TS; prov. Muğla: 10 km E of Muğla, Kötekli, 2001. V. 17., RG et RIB; prov. Manisa: Sartmustafa, Sardes, 2001. V. 15., RG et RIB; 5 km SE of Manisa, 2001. V. 15., RG et RIB; prov. Denizli: 3 km N of Buldan, 2001. V. 16., RG et RIB - General distribution: Endemic species from West-Anatolia. Occurrence: enviroment Izmir, rare.

Pygopleurus madenensis (Petrovitz, 1968) - prov. Içel: Mts. Taurus, Aladağ, 1984. V. 13., RI et RA; prov. Yozgat: Derbent, 1989. VI. 10., RI et RA; prov. Afyon: 15 km NE of Afyon, Altihisar, 2001. V. 24., RG - General distribution: Anatolian-Caucasian species. Occurrence: sporadic and rare.

Pygopleurus medius (Petrovitz, 1957) - prov. Manisa: Sartmustafa, Sardes, 2001. V. 15., RG et RIB - General distribution: Endemic species in South- and West-Anatolia. Occurrence: rare.

Pygopleurus mithridates (Petrovitz, 1962) - prov. Afyon: 15 km NE of Afyon, Atlihisar, 2001. V. 24., RG; prov. Bilecik: 10 km S of Bözüyük, Daridere, 2001. V. 26., RG et RIB; prov. Bursa: Mts. Ulu Dağ, 1200 m, Sogukpinar, 2001. V. 28., RG; prov. Denizli: 5 km W of Tavas, Keceliler, 2001. V. 17., RG et RIB - General distribution: Endemic species in West-Anatolia. Occurrence: not frequent.

Pygopleurus psilotrichius (Faldermann, 1835) - vil Gümüşhane: Siran, 1987. V. 20., RI et RA; prov. Kars: Mts. Ararat, 1989. VI. 4., RI et RA; prov. Siirt: Köprücek, 1989. V. 1., RA et RL; - General distribution: Anatolian-Caucasian species. Occurrence: sporadic and not frequent.

Pygopleurus rufovillosus (Reitter, 1907) - vil. Gümüşhane: Siran, 1987. V. 20., RI et RA; prov. Giresun: Mts. Giresun, Şebinkarahisar, 1987. V. 19., RI; prov. Sivas: Sandal, 1987. V. 24., RI - General distribution: Caucasian-Anatolian species. Occurrence: it is frequent in East- and North-Anatolia. TN: *Quercus*-spp.

Pygopleurus simplex (Petrovitz, 1963) - prov. Tekirdağ: 10 km N of Çerkezköy, 158 m, 2006. V. 11., RG et RIB; prov. Bursa: Mts. Ulu Dağ, Sogukpinar, 2008. V. 28., RG et RIB; prov. Eskişehir: Yazilikaya Yaylasi, 5 km S of Gökbahce, 2001. V. 25., RG et RIB - General distribution: Balkan-Anatolian species. Occurrence: sporadic and rare.

Pygopleurus vulpes (Fabricius, 1781) - prov. Edirne: Hamidiye, 1984. V. 1., RI; 20 km SE of Edirne, 109 m, 2006. IV. 16., RG et RIB; prov. Tekirdağ: 10 km N of Cerkezköy, 158 m, 2006. V. 11., RG et RIB; prov. Eskisehir: Yazilikaya Yaylasi, 5 km S of Gökbahçe, 25. V. 2001., RI et RA - General distribution: European-Anatolian species. Occurrence: sporadic and rare. TN: *Papaver rhoeas, Singris-, Genista-, Hyacinthus-, Vicia-, Euphorbia*-spp.

Melolonthidae

Anoxia Castelnau, 1832

Anoxia (s.str.) asiatica Desbrochers, 1871 - prov. Ankara: Çamlidere, 1200 m, light trap, 1996. VI. 24-25., RI et PA - General-distribution: Caucasian-Anatolian species. Occurrence: sporadic and frequent. It flies at light.

Anoxia (s.str.) villosa villosa Fabricius, 1781 - prov. Tokat: Çamlibel pass, 1700 m, 1996. VI. 27., at light, SZD - General distribution: Mediterranean species. Occurrence sporadic and not frequent.

Anoxia (Protanoxia) orientalis (Krynicky, 1832) - prov. Adiyaman: bank of Pamukçay-river, 1989. V. 31., RI et RA; prov. Erzincan: 5 km E of Erzincan, 1996. VI. 27., RI - General distribution: Mediterranean species. Occurrence wide-spread and frequent.

Melolontha Fabricius, 1775

Melolontha albida Frivaldszky, 1835 - prov. Çanakkale: Ezine, 1982. V. 2., RI; prov. Manisa: Marmara Gölü, 1990. IV. 21., PA; prov. Izmir: Bergama, Asklepiyon, 1984. V. 3., SZD; Efas, 1984. V. 4., SZD; prov. Içel: Mts. Taurus, Çamlyayla, 1984. V. 15., SZD - General distribution: Balkan-Anatolian species. Occurrence: wide-spread, but not frequent.

Melolontha melolontha (Linnaeus, 1758) - prov. Artvin: Çankurtaran-pass, 800 m, 1996. VII. 1-2., RI - General distribution: European-Caucasian species. Occurrence: wide-spread and frequent.

Polyphylla Harris, 1842

Polyphylla olivieri Castelnau, 1840 - prov. Adiyaman: bank of Pamukçay-river, 1989. V. 31., RI; prov. Antalya: Antalya, 2001. V. 22., RG et RIB; prov. Ankara: Tuz Gölü, 20 km NW of Sereflikochisar, 1994. VII. 1., ÁL - General distribution: Caucasian-Anatolian species. Occurrence: wide-spread on the eastern- and northeastern regions of Turkey. Not frequent.

Amphimallon Le Peletier et Serville, 1825

Amphimallon caucasicum (Gyllenhal, 1817) - prov. Antalya: 10 km N of Manavgat, Bucakseyhier, 2001. V. 22., RG et RIB - General distribution: Balkan-Anatolian species. Occurrence: wide-spread and frequent.

Amphimallon keithi Montreuil, 2002 - prov. Sivas: Gürün, 1500 m, 1991. VI. 18-19., SC - General distribution: Balkan-Anatolian species. Occurrence: wide-spread, but rare.

Amphimallon solstitiale orientale Brenske, 1902 - prov. Giresun: Eğribel pass, 2200 m, 1996. VII. 6., SZD - General distribution: European species. This subspecies lives in Asia Minor, mainly on the northern mountains.

Amphimallon tarsensis Kraatz, 1882 - prov. Içel: Mersin, 1984. V. 12., SZD - General distribution: East-Mediterranean species. Occurrence: This species known mainly from Taurus Mts., not frequent.

Haplidia Hope, 1837

Haplidia transversa transversa (Fabricius, 1801) - prov. Muğla: 5 km NW of Kargi, Katranci, 2001. V. 18-20., RG et RIB - General distribution: Central- and South-European-Anatolian species. Occurrence: wide-spread and frequent in the western region of Turkey.

Haplidia turcica Kraatz, 1882 - prov. Eskişehir: Büyük Yayla, 1989. VI. 12., RI et RA - General distribution: Endemic species of Turkey. Occurrence: rare.

Haplidia tarsensis Kraatz, 1882 - prov. Içel: Mersin, 1984. V. 12., RI; Narlikuyu, 1984. V. 12., RI - General distribution: Endemic species of Turkey. Occurrence: It lives in South-Anatolia, rare.

Haplidia vagepunctata Kraatz, 1882 - prov. Adana: Hieropolis, 1989. V. 27., RI et RA - General distribution: Endemic species of Turkey. Occurrence: wide-spread and frequent on southern region of Anatolia.

Holochelus Reitter, 1889

Holochelus costulatus Frivaldszky, 1835 - prov. Eskişehir: Yazilikaya, Midas Şehri, 2001. V. 26., RG - General distribution: Balkan-Anatolian species. Occurrence: sporadic, not frequent.

Holochelus fallax Marseul, 1879 - prov. Sivas: Gügün, 1500 m, 1990. V 28-29., SC - General distribution: Anatolian-Syrian species. Occurrence: rare.

Odontochelus Semenov

Odontochelus lineolatus Reitter, 1902 - prov. Afyon: 30 km N of Afyon, Arslantaş, 2001. V. 25., RG et RIB - General distribution: Endemic species of Anatolia. Occurrence: sporadic and rare.

Miltotrogus Reitter, 1902

Miltotrogus aequinoctialis (Herbst, 1790) - prov. Eskişehir: Sükrani Köyü, 1987. V. 29., RI; prov. Sivas: Sandal, 1987. V. 24., RI et RA; Ortagöze, 1987. V. 23., RI; prov. Çorum: Bogazkale, 1987. V. 14-16., RI - General distribution: Pontic species. Occurrence: wide-spread and frequent.

Miltotrogus escherichi (Brenske, 1897) - prov. Ankara: Pazar, 1984. V. 19., SZD - General distribution: Asianic species. Occurrence: wide-spread, but not frequent.

Miltotrogus fallax (Marseul, 1879) - prov. Nevşehir: Kappadokia, Göreme, 1984. V. 16-17., RI, RA et SZD - General distribution: European-Turanian species. Occurrence: wide-spread and frequent.

Pseudotrematodes Jacquelin du Val, 1860

Pseudotrematodes frivaldszkyi (Ménétriés, 1836) - prov. Çorum: Balgöze, 1987. V. 16., RI et RA; Sekerhacili, 1987. V. 15., RI; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI et SZD; prov. Izmir: Bergama, Pergamon, 1984. V. 3., RI et SZD, 1989. V. 23., RI et RA; Selçuk, Ephesos, 1984. V. 4., RI; prov. Çanakkale: Ezine, 1984. V. 2., RI et SZD; Gelibolu Yarimadasi, Bayirköy, 2001. V. 12., RG et RIB; prov. Aydin: Umurlu, 1984. V. 4., RI, RA et SZD; prov. Sivas: Sandal, 1987. V. 29., RI et RA; prov. Ankara: Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI; prov. Manisa: Sartmustafa, 1989. V. 24., RI; prov. Erzurum: Askale, 1990. IV. 13., OA; prov. Konya: 55 km SE of Konya, 1990. IV. 17., OA; prov. Edirne: Çukurköy, 2001. V. 12., RG et RIB; prov. Niğde: Aksaray, 1990. IV. 17., SZD - General distribution: Balkan-Anatolian species. Occurrence: wide-spread and common.

Rhizotrogus Berthold, 1827

Rhizotrogus aestivus (Olivier, 1789) - prov. Ankara: Pazar, 1987. V. 12., RI; prov. Erzincan: Basköy, 1989. VI. 7., RI - General distribution: European-Anatolian species. Occurrence: wide-spread and frequent.

Tanyproctus Faldermann, 1835

Tanyproctus (s.str.) rufidens (Marseul, 1879) - prov. Erzurum: Askale, 1990. V. 13., OA - General distribution: Caucasian species. Occurrence: rare.

Homaloplia Stephens, 1830

Homaloplia (s.str.) alternata alternata Küster, 1849 - prov. Sivas: 10 km W of Kavak, 1996. VI. 26., RI; Seyfebeli, 1996. VI. 27., RI - General distribution: European-Siberian species. Occurrence: wide-spread and frequent.

Homaloplia (s.str.) baraudi Galante, 1985 - prov. Ordu: Harcbeli pass, 1900 m, 1996. VII. 6., RI et SZD; prov. Giresun: Tamdere, 1600 m, 1996. VII. 7., RI - General distribution: Endemic species of Asia Minor. Occurrence: sporadic and not frequent.

Homaloplia (s.str.) cerrutii Sabatinelli, 1977 - prov. Kirklareli: Kuzulu Köyü, 500 m, 1996. VI. 24., SZD - General distribution: Balkan species. Occurrence: it found in the European-Turkey, but not frequent.

Homaloplia (s.str.) ruricola (Fabricius, 1775) - prov. Içel: Mts. Taurus, Ayaş, 1984. V. 12., SZD - General distribution: European species. This is a new record for Asia Minor.

Homaloplia (Acarina) labrata Burmeister, 1855 - prov. Manisa: 5 km SE of Manisa, 2001. V. 15., RG et RIB - General distribution: East-Mediterranean species. Occurrence: rare.

Homaloplia (Acarina) spiraeae (Pallas, 1776) - prov. Sivas: Üyük, 1300 m, 1996. VI. 26., SZD; 10 km W of Kavak, 1996. VI. 26., RI; prov. Tokat: Çamlibel pass, 1730 m, 1996. VI. 26., SZD; prov. Kirklareli: Kuzulu Köyü, 1996. VI. 24., RI; prov. Izmir: Boz Dağlari, 12 km N of Ödemis, 2001. V. 15., RG et RIB; prov. Isparta: Boyali, coast of Egirdir Gölü, 2001. V. 24., RG et RIB; prov. Manisa: Sartmustafa, Sardes, 2001. V. 15., RG et RIB - General distribution: European-Siberian species. Homaloplia spiraeae adulta Reitter, 1887 subspecies is found in Caucasus and Anatolia according to Baraud (1992).

Maladera Mulsant et Rey, 1871

Maladera (Aserica) punctatissima (Faldermann, 1835) - prov. Içel: Mts. Taurus, Çamlyayla, 1600 m, 1989. V. 27., RI; prov. Isparta: 15 km N of Sütçüler, Sipahiler, 2001. V. 23., RG et RIB; prov. Muğla: Karabögürtlen, 2001. V. 17., RG et RIB; prov. Adana: 60 km E of Adana, 2006. IV. 17., RG et RIB - General distribution: Anatolian-Caucasian species. Occurrence: sporadic and rare.

Maladera (Macroserica) armeniaca Reitter, 1896 - prov. Sivas: Gügün, 1500 m, 1990. V. 28-29., SC - General distribution: Asianic species. Occurrence: rare.

Maladera (Macroserica) besucheti Baraud, 1990 - prov. Isparta: 15 km N of Sütçüler, Sipahiler, 2001. V. 23., RG et RIB - General distribution: Asianic species. Occurrence: rare.

Hoplia Illeger, 1803

Hoplia caucasica Kolenati, 1846 - prov. Giresun: Tamdere, 1600 m, 1996. VII. 7., SZD - General distribution: Caucasian species. This is a new record for Turkey.

Hoplia cylindrica Reitter, 1903 - prov. Tokat: Çamlibel pass, 1300 m, 1996. VI. 27., SZD - General distribution: Caucasian-Turanian species. This is a new record for Turkey.

Hoplia kunzii Schmidt, 1840 - prov. Giresun: Tamdere, 1600 m, 1996. VII. 7., RI - General distribution: Pontomediterranean species. Occurrence: wide-spread and rare.

Hoplia pollinosa Krynicki, 1832 - prov. Rize: Çamçavus, 900 m, 1996. VII. 3., RI et SZD; prov. Ardahan: Yalnizcam pass, 2500 m, 1996. VI. 30., RI et SZD; prov. Giresun: Tamdere, 1600 m, 1996. VII. 7., RI et SZD; prov. Ordu: Harcbeli pass, 1900 m, 1996. VII. 6., RI et SZD; prov. Artvin: Çam pass, 1600 m, 1996. VI. 30., SZD - General distribution: Caucasian species. This is a new record for Turkey.

Rutelidae

Anisoplia Fischer, 1824

Anisoplia (Autanisoplia) austriaca austriaca (Herbst, 1783) - prov. Tekirdağ: Naibköy, 2001. VI. 5., RG et RIB - General distribution: European species. It is found in European Turkey. Occorrence: not rare.

Anisoplia (Autanisoplia) austriaca miksici (Baraud, 1991) - prov. Kars: Mts. Karasu-Aras, bank of Aras, 1989. VI. 5., RI et RA; prov. Erzincan: Tercan, 1500 m, 1996. VI. 28., RI et SZD; prov. Çorum: Sungurlu, 1996. VI. 25., RI; prov. Çankiri: Susuz, 1200 m, 1996. VII. 9., RI et SZD; prov. Tekirdağ: Naibköy, 2001. VI. 5., RG et RIB; prov. Muğla: Boncuk Dağı, Üzümlü, 2001. V. 19., RG et RIB; prov. Ankara: Delice, 800 m, 1996. VI. 27., SZD - General distribution: Balkan-Anatolian subspecies. Occurrence: wide-spread and frequent.

Anisoplia (s.str.) agricola (Poda, 1761) - prov. Tekirdağ: Naibköy, 2001. VI. 5., RG et RIB - General distribution: European-Siberian species. Occurrence: wide-spread and frequent.

Anisoplia (s.str.) aprica Erichson, 1847 - prov. Balikesir: Kapidağı Yarimadasi, Çakilköy, 2001. VI. 1., RG et RIB - General distribution: West-Anatolian species. Occurrence: not frequent.

Anisoplia (s.str) farraria Erichson, 1847 - prov. Erzincan: Tercan, 1500 m, 1996. VI. 26., SZD - General distribution: Caucasian species. Occurrence: It is found on the eastern region of Turkey. Not frequent.

Anisoplia (s.str.) lodosi Baraud, 1990 - prov. Denizli: Pamukkale, 2001. V. 16-17., RG et RIB - General distribution: Anatolian endemic species. Occurrence: it is most frequent in West-Anatolia, not rare.

Anisoplia (s.str) dispar Erichson, 1847 - prov. Sivas: Seyfebeli, 1450 m, 1996. VI. 27., RI; prov. Rize: Çamçavus, 900 m, 1996. VII. 3., RI; prov. Giresun: Tamdere, 1600 m, 1996. VII. 7., RI; prov. Kars: Mts. Karasu-Aras, bank of Aras, 1989. VI. 5., RI - General distribution: Balkan-Anatolian species. Occurrence: This species the mountainous districts wide-spread and frequent.

Anisoplia (s.str.) signata Faldermann, 1835 - prov. Rize: Çamcavus, 900 m, 1996. VII. 3., SZD; prov. Artvin: Çam pass, 1600 m, 1996. VI. 30., SZD; Yalnizçam pass, 2000 m, 1996. VII. 1., SZD; prov. Tokat: Çamlibel pass, 1700 m, 1996. VI. 27., SZD; prov. Erzurum: Aksu, 1650 m, 1996. VI. 28., SZD; prov. Giresun: Tamdere, 1600 m, 1996. VII. 7., SZD - General distribution: Caucasian species. Occurrence: wide-spread and frequent.

Anisoplia (s.str.) tenebralis Burmeister, 1844 - prov. Izmir: Mts. Boz Dağlari, 10 km N of Ödemis, 2001. V. 15., RG et RIB - General-distribution: Balkan-Anatolian species. Occurrence: sporadic and rare.

Brancoplia Baraud, 1986

Brancoplia leucaspis (Castelnau, 1840) - prov. Siirt: Çayan, 1989. V. 31., RI et RA - General distribution: Anatolian-Caucasian species. Occurrence: sporadic and not frequent.

Chaetopteroplia Medvedev, 1949

Chaetopteroplia muelleri (Pilleri, 1954) - prov. Içel: Mts. Taurus, Namrun, Çamlyayla, 1400 m, 1983. VI 24-30., GK - General distribution: East-Mediterranean species. Occurrence: sporadic, rare.

Chaetopteroplia segetum velutina Erichson, 1848 - prov. Eskişehir: Kirka, 1989. VI. 13., RI et RA; Seyitgazi, 1989. VI. 12., RI; prov. Balikesir: Ulukir, 1989. VI. 15., RI; Kapidağı Yarimadasi, Cayağzi, 2001. VI. 1., RG et RIB; prov. Bursa: Ulu Dağ, 1989. VI. 14., RI; prov. Kars: Aras-valley, 1989. VI. 5., RI; Mts. Karasu-Aras, bank of Aras, 1989. VI. 5., RI; Kagizman, 1989. VI. 5., RI; prov. Sivas: 31 km E of Hafik, bank

of Kizilirmak, 1989. VI. 8., RI; prov. Ağri: Meydandaği, 1989. VI. 3., RI; prov. Konya: Çariklar, 1989. V. 25., RI; prov. Izmir: Selçuk, Ephesos, 1984. V. 4., RI; Mts. Boz Dağlari, 12 km N of Ödemis, 2001. V. 15., RG et RIB; prov. Antalya: Aksu, Perge, 1984. V. 8., RI et SZD; 10 km N of Manavgat, Bucakseyhler, 2001. V. 22., RG et RIB; prov. Içel: Anamur, 1984. V. 11., RI; prov. Çorlu: 1987. VI. 3., RI; prov. Erzurum: 11 km S of Uzundere, 1400 m, 1996. VI. 29., RI; prov. Muğla: 5 km NW of Kargi, Katranci, 2001. V. 18-20., RG et RIB; Boncuk Dağı, Üzümlü, 2001. V. 19., RG et RIB; prov. Manisa: Sartmustafa, Sardes, 2001. V. 15., RG; prov. Tekirdağ: Naibköy, 2001. VI. 5., RG et RIB; prov. Denizli: 3 km N of Buldan, 2001. V. 16., RG et RIB; prov. Edirne: 4 km N of Kesan, 2001. V. 13., RG et RIB; prov. Çanakkale: Truva (Troja), 2001. V. 13., RG et RIB; prov. Ordu: Güzle, 1000 m, 1996. VII. 6., SZD - General distribution: Pontic subspecies. Occurrence: very wide-spread and common.

Blitopertha Reitter, 1903

Blitopertha lineolata (Fischer, 1823) (= *flavipennis* Reitter, 1903) - prov. Tekirdağ: Muratli, 1984. V. 23., RI; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI et SZD; Çardak, 1984. V. 6., RI, RA et SZD; 3 km N of Buldan, 2001. V. 16., RG et RIB; prov. Nevşehir: Kappadokia, Göreme, 1984. V. 16-17., RI; prov. Izmir: Bergama, Pergamon, 1984. V. 3., RI, RA et SZD, 2001. V. 14., RG et RIB; Selçuk, Ephesos, 1984. V. 4., RI, RA et SZD; Mts. Boz Dağlari, 12 km N of Ödemis, 2001. V. 15., RG et RIB; prov. Antalya: Güney, 1984. V. 10., RI, RA et SZD; Aksu, Perge, 1984. V. 8., RI et SZD; Kalediran, 1984. V. 10., RI et RA; Payallar, 1984. V. 9., RI et RA; Kizilot, 1984. V. 9., SZD; prov. Içel: Anamur, 1984. V. 11., RI; prov. Aydin: Isabeyli, 1984. V. 4., RI; Ortaklar, 1984. V. 4., SZD; prov. Balikesir: Mt. Kapi Dağ, 400 m, Ocaklar, 2001. V. 30., RG et RIB; Kapi Dağ, Ballipinar, 2001. V. 31., RG; Dari Kum, 2001. V. 30., RG et RIB; prov. Edirne: 4 km N of Keşan, 2001. V. 12., RG et RIB; prov. Kirklareli: 10 km SE of Kirklareli, 205 m, Kizilcikdere, 2006. V. 11., RG; prov. Afyon: Gazligöl, 1987. V. 30., RI et RA; Kunduzlu, 1987. V. 30., RI et RA; 30 km N of Afyon, Arslantaş, 2001. V. 25., RG et RIB; prov. Çorlu: Çorlu, 1987. VI. 3., RI; prov. Eskişehir: Oglacki, 1987. V. 28., RI; Yazilikaya, Midas Şehri, 2001. V. 26., RG et RIB; Seyitgazi, 2001. V. 26., RG et RIB; prov. Manisa: Sartmustafa, Sardes, 2001. V. 15., RG et RIB; prov. Bursa: Mts. Ulu Dağ, 1500 m, Bursa, 2001. V. 28., RG et RIB; prov. Isparta: coast of Eğirdir-gölü, Boyali, 2001. V. 24., RG et RIB; prov. Artvin: Çam pass, 1600 m, 1996. VI. 30., SZD - General distribution: Balkan-Anatolian species. Occurrence: This species is found the western region of Turkey. Wide-spread and common.

Blitopertha majuscula Medvedev, 1949 (= *abdita* Petrovitz, 1959, nigripennis Reitter, 1888) - prov. Kars: Mts. Ararat, 1989. VI. 4., RI; Kagizman, 1989. VI. 5., RI; Aras, Delibaba, 2000. VI. 12., RG; prov. Sakarya: Düzce, 1984. V. 20., RI; prov. Içel: Mts. Taurus, Kerimler, 1984. V. 13., RI et RA; Korykos, 1984. V. 12., RI et RA; Mts. Taurus, 1600 m, Çamlyayla, 1984. V. 15, SZD, 1989. V. 27., RI et RA; Ayaş, 1984. V. 12., SZD; Aladağ, 1984. V. 13., SZD; Yavca, 1984. V. 13., SZD; prov. Edirne: Paşayiğit, 1989. V. 21., RI; Koru Dağ, 1989. V. 22., RI; prov. Eskişehir: Kirka, 1989. VI. 13., RI; Midas Şehri, 1989. VI. 12., RI; prov. Yozgat: Derbent, 1989. VI. 10., RI; prov. Ağri: Meydandaği, 1989. VI. 3., RI et RA; prov. Adana: Kabasakal, 1990. IV. 3., SZD; prov. Adiyaman: Firat N., Karababa Köprü, 1990. IV. 28., SZD - General distribution: East-Mediterranean species. Occurrence: wide-spread and common.

Exomala Reitter, 1903

Exomala (Trichopertha) hirtella (Brullé, 1832) - prov. Eskişehir: Yazilikaya, Midas Şehri, 2001. V. 26., RG et RIB; prov. Afyon: 30 km N of Afyon, Arslantaş, 2001. V. 25., RG et RIB - General distribution: Balkan-Anatolian species. Occurrence: wide-spread and frequent.

Pharaonus Blanchard, 1851

Pharaonus varicoloreus Burmeister, 1844 - prov. Siirt: Bank of Kahveci, 1989. V. 31., RI; Çayan, 1989. V. 31., RI - General distribution: Levant-Mesopotamian species. Occurrence: it is the parasite of cotton in south-eastern Anatolia, not frequent.

Dynastidae

Pentodon Hope, 1837

Pentodon algerinum dispar Baudi, 1870 - prov. Antalya: Antalya, 1984. V. 7., RI et SZD; 10 km N of Manavgat, Bucakseyhler, 2001. V. 22., RG; prov. Muğla: 5 km NW of Kargi, Katranci, 2001. V. 18-20., RG et RIB - General distribution: East-Mediterranean subspecies. Occurrence: sporadic and frequent.

Pentodon bidens sulcifrons Küster, 1848 - prov. Izmir: Selçuk, Ephesos, 1984. V. 4., RI; prov. Çorum: Balgöze, 1987. V. 16., RI; prov. Konya: Argithani, 1989. V. 24., RI ; prov. Antalya: 10 km N of Manavgat, Bucakseyhler, RG; prov. Erzurum: Tortum, 1996. VI. 28., RI; Erzurum, 1990. IV. 13., SZD; prov. Ankara: Tuz Gölü, 20 km NW of Sereflikocisar, 1994. VII. 1., ÁL; Tuz Gölü, 8 km N of Sereflikochisar, 110 m, 1990. IV. 15-25., HB et ROG; prov. Balikesir: Kapidaği Yarimadasi, Kyzikos, 2001. V. 29., RG et RIB; prov. Çanakkale: Ezine, 1984. V. 2., SZD; prov. Urfa: Halfeti, valley of Euphrat, 500 m, 1990. IV. 15-18., HB et ROG - General distribution: East-Mediterranean subspecies. Occurrence: wide-spread and frequent.

Pentodon caminarium (Faldermann, 1835) - prov. Çorum: Balgöze, 1987. V. 16., RI; prov. Konya: Argithani, 1989. V. 24., RI; prov. Kirşehir: Hamit, 1984. V. 18., RI - General distribution: Caucasian-Anatolian subspecies. Occurrence: sporadic and rare.

Pentodon idiota (Herbst, 1789) - prov. Ankara: Izzettin, 30 km E of Kirikkale, 1987. V. 13., RI; prov. Adiyaman: bank of Pamukçay, 1989. V. 31., RI; prov. Kirklareli: Erenzer, 261 m, 2006. V. 11., RG et RIB; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., SZD, Pamukkale, 2001. V. 16-17., RG et RIB; prov. Istambul: Istambul, 1984. V. 21., SZD - General distribution: Pontomediterranean species. Occurrence: wide-spread and frequent.

Pentodon quadridens distantidens Reitter, 1899 - prov. Içel: Mersin, 1984. V. 12., RI; Tarsus, 1984. V. 13., SZD - General distribution: East-Mediterranean subspecies. Occurrence. Sporadic and rare.

Cetoniidae

Valgus Scriba, 1790

Valgus hemipterus (Linnaeus, 1758) - prov. Tekirdag: Muratli, 1984. V. 23., RI; Saray, 172 m, 2006. V. 11., RG et RIB; prov. Nevşehir: Kappadokia, Göreme, 1984. V. 16-17., RI; prov. Burdur: Dinar, 1984. V. 6., RI; prov. Ordu: Çamas, 1987. V. 17., RI; prov. Bilecik: Mezit, 1987. V. 31., RI et RA; prov. Edirne: Koru Dağ, 1989. V. 22., RI; prov. Çanakkale: Mt. Kuru Dağ, Kocaçeşme, 2001. V. 12., RG et RIB; prov. Manisa: 5 km SE of Manisa, 2001. V. 15., RG et RIB; prov. Kirklareli: 20 km SE of Kirklareli, Kizilcikdere, 205 m, 2006. V. 11., RG et RIB; prov. Isparta: 15 km of Sütcüler, Sipahiler, 2001. V. 23., RG et RIB; prov. Izmir: Nusratli, 1984. V. 2., SZD - General distribution: West-Palearctic species. Occurrence: wide-spread and common.

Valgus peyroni Mulsant, 1852 - prov. Adana: Hieropolis, 1989. V. 27., RI; prov. Kütahya: Tavşanli, 1989. VI. 13., RI - General distribution: Anatolian species. Occurrence: sporadic and rare.

Trichius Fabricius, 1775

Trichius abdominalis Ménétriés, 1832 - prov. Rize: Çamcavus, 900 m, 1996. VII. 3., SZD - General distribution: Caucasian species. Occurrence: very rare.

Trichius fasciatus (Linnaeus, 1758) - prov. Ardahan: Yalnizcam, 2500 m, 1996. VI. 30., RI et SZD - General distribution: European-Siberian species. Occurrence: it is on the mountainous districts of East-Turkey sporadic and rare.

Aethiessa Burmeister, 1842

Aethiessa rugipennis Burmeister, 1842 - prov. Adiyaman: Asagi Coplu Köyü, 1989. V. 29., RI et RA; Cendere Köprösü, 1989. V. 29., RI - General distribution: Caucasian species. Occurrence: it is the mountainous districts of East-Turkey sporadic, not frequent. Many authors consider the subspecies of Aethiessa mesopotamica Burmeister, 1842.

Cetonia Fabricius, 1775

Cetonia aurata aurata (Linnaeus, 1761) - prov. Ağri: Meydandağı, 1989. VI. 3., RI et RA; Batmis, 1989. VI. 5., RI; prov. Gümüshane: Siran, 1987. V. 20., RI; prov. Bilecik: Mezit, 1987. V. 31., RI; prov. Ordu: Medreseönü, 1987. V. 18., RI; Mesudiye, 1400 m, 1996. VII. 6., RI et SZD; prov. Kars: Mts. Ararat, 1800 m, 1989. VI. 4., RI et RA; prov. Eskişehir: Midas Şehri, 1989. VI. 12., RI; Kirka, 1989. VI. 13., RI; prov. Edirne: Koru Dağ, 1989. V. 22., RI; prov. Içel: Mts. Taurus, 1600 m, Çamlyayla, 1989. V. 27., RI; prov. Erzincan: Refahiye, 1989. VI. 8., RI; 46 km W of Tercan, 1200 m, 1996. VI. 28., RI et SZD; prov. Balikesir: Ulukir, 1989. VI. 15., RI; prov. Artvin: Cam-pass, 1600 m, 1996. VI. 30., RI; Savsat, 1000 m, 1996. VI. 29., SZD; prov. Kirklareli: 20 km SE of Kirklareli, 600 m, 2006. V. 11., RG et RIB; prov. Tekirdag: Saray, 172 m, 2006. V. 11., RG et RIB; prov. Ankara: Çamlidere pass, 1300 m, 1996. VI. 25., SZD; prov. Erzurum: Aksu, 1650 m, 1996. VI. 28., SZD; 11 km S of Uzundere, 1400 m, 1996. VI. 29., SZD; prov. Giresun: Tamdere, 1600 m, 1996. VII. 7., SZD - General distribution: Palearctic species. Occurrence: very wide-spread and common.

Cetonia aurata pallida (Drury, 1770) - prov. Balikesir: Mt. Kapi Dağ, 400 m, Ocaklar, 2001. V. 30., RG; Mt. Kapi Dağ, 400 m, Erdek, 2001. V. 29-VI. 2., RG et RIB; prov. Ankara: Camlidere, 1200 m, 1996. VI. 24-26., RI; prov. Tekirdağ: Saray, 172 m, 2006. V. 11., RG - General distribution: Pontomediterranean subspecies. Occurrence: wide-spread and common.

Cetonia delagrangei Boucard, 1893 - prov. Içel: Mts. Taurus, Namrun, Çamlyayla, 1400 m, 1983. VI. 24-30., GK - General distribution: East-Mediterranean species. Occurrence: sporadic and rare.

Cetonischema Reitter, 1898

Cetonischema speciosa venusta (Ménétriés, 1836) - prov. Balikesir: Mt. Kapi Dağ, 400 m, Erdek, 2001. V. 29 - VI. 2., RG et RIB - General distribution: Anatolian subspecies. Occurrence: wide-spread and frequent.

Eupotosia Miksic, 1954

Eupotosia affinis (Andersch, 1797) - prov. Balikesir: Ulukir, 1989. VI. 15., RI - General distribution: European-Anatolian species. Occurrence: sporadic and rare.

Netocia Costa, 1852

Netocia (s.str.) afflicta (Gory et Percheron, 1833) - prov. Içel: Narlikuyu, 1984. V. 12., RI et SZD; Anamur, 1984. V. 11., RI, RA et SZD; prov. Adiyaman: Mts. Nemrut, 1600 m, 1989. V. 29., RI; prov. Siirt: Çayan, 1989. V. 31., RI - General distribution: East-Mediterranean species. Occurrence: wide-spread and frequent.

Netocia (s.str.) hungarica hungarica (Herbst, 1790) - prov. Çorlu: Çorlu, 1987. VII. 3., RI; prov. Eskişehir: Oglacki, 1987. V. 28., RI; Yazilikaya, Midas Şehri, 2001. V. 26., RG et RIB; prov. Bursa: 25 km E of Karacabey, Bozamlat, 2001. V. 28., RG et RIB; prov. Afyon: Çalislar, 2001. V. 25., RG et RIB; Sohut, 2001. V. 25., RG et RIB - General distribution: European-Anatolian species. Occurrence: wide-spread and frequent.

Netocia (s.str.) hungarica anatolica Medvedev, 1947 - prov. Edirne: Paşayiğit, 1989. V. 21., RI; prov. Balikesir: Ulukir, 1989. VI. 19., RI; prov. Yozgat: Yozgat, 1989. VI 10., RI - General distribution: Anatolian subspecies. Occurrence: wide-spread and frequent.

Netocia (s.str.) hungarica armeniaca (Ménétriés, 1832) - prov. Kars: Mts. Ararat, 1800 m, 1989. VI. 4., RI et RA; prov. Ankara: Cigir, 1984. V. 19., RI, RA et SZD; prov. Ağri: Batmis, 1989. VI. 3., RI et RA; Meydandaği, 1989. VI. 3., RI et RA; prov. Çorum: Büyükincesu, 1996. VI 26., RI et SZD; prov. Yozgat: Saraykent, 1996. VI. 26., RI et SZD; prov. Erzurum: 11 km S of Uzundere, 1400 m, 1996. VI. 29., RI; 6 km W of Askale, 1900 m, 1996. VI. 18., RI et SZD; Tercan, 1500 m, 1996. VI. 28., SZD; prov. Çankiri: Susuz, 1200 m, 1996. VII. 9., RI et SZD; prov. Artvin: Savsat, 1000 m, 1996. VI. 29., SZD - General distribution: Caucasian-Anatolian subspecies. Occurrence: wide-spread and common.

Netocia (s.str.) hungarica ignisternum Reitter, 1891 - prov. Ağri: Mts. Karasu-Aras Dağlari, Tahir, 2000. VII. 5., RG - General distribution: Caucasian subspecies. Occurrence: it is in eastern Turkey sporadic and rare.

Netocia (s.str.) subspilosa (Desbrochers, 1869) - prov. Kars: Karakurt, 1989. VI. 5., RI et RA; prov. Adana: Hieropolis, 1989. V. 27., RI; prov. Izmir: Bergama, Asklepiyon, 1984. V. 5., SZD - General distribution: East-Mediterranean species. Occurrence: wide-spread and frequent.

Netocia (s.str.) trojana godeti (Gory et Percheron, 1833) - prov. Kars: Mts. Ararat, 1989. VI. 4., RI; vil Ağri: Mts. Karasu-Aras Dağlari, Tahir, 2000. VII. 5., RG; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., SZD - General distribution: Caucasian subspecies. Occurrence: This is found mainly in eastern Turkey, rare.

Netocia (s.str.) trojana trojana (Gory et Percheron, 1833) - prov. Adiyaman: Narince, 1990. IV. 7., SZD - General distribution: Balkan-Asianic subspecies. Occurrence: sporadic and not frequent.

Netocia (s.str.) vidua (Gory et Percheron, 1833) - prov. Izmir: Bergama, Pergamon, 1984. V. 3., RI, RA et SZD; prov. Ağri: Batmis, 1989. VI. 3., RI; prov. Eskişehir: Yazilikaya, Midas Şehri, 2001. V. 26., RG et RIB; prov. Çanakkale: Mt. Koru Dağ, Kocaçeşme, 2001. V. 12., RG et RIB; prov. Kütahya: Yoncali, 2001. V. 27., RG et RIB; prov. Kirklareli: 20 km SE of Kirklareli, 600 m, 2006. V. 11., RG et RIB; Kuzulu Köyü, 500 m, 1996. VI. 24., SZD; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., SZD - General distribution: East-Mediterranean species. Occurrence: wide-spread and frequent.

Netocia (Potosia) angustata (Germar, 1817) - prov. Içel: Anamur, 1984. V. 11., RI, RA et SZD; prov. Balikesir: Ulukir, 1989. VI. 15., RI: vil Muğla: Boncuk Dağı, Üzümlü, 2001. V. 19., RG et RIB - General distribution: Mediterranean species. Occurrence: wide-spread and frequent.

Netocia (Potosia) cuprea obscura (Andersch, 1797) - prov. Balikesir: Ulukir, 1989. VI. 15., RI - General distribution: South-European subspecies. Occurrence: sporadic and not frequent.

Netocia (Potosia) cuprea phoebe Reitter, 1898 - prov. Adiyaman: Asagi Coplu Köyü, 1989. V. 29., RI et RA; prov. Balikesir: Mt. Kapi Dağ, 400 m, Erdek, 2001. V. 29 - VI. 2., RG et RIB - General distribution: Anatolian subspecies. Occurrence: sporadic and rare.

Netocia (Potosia) cuprina (Motschulsky, 1849) - prov. Içel: Anamur, 1984. V. 11., RI et RA; Narlikuyu, 1984. V. 12., SZD; prov. Nevşehir: Kappadokia, Göreme, 1984. V. 16-17., RI; prov. Eskişehir: Kaymaz, 1989. VI. 11., RI; Yazilikaya, Midas Şehri, 2001. V. 26., RG et RIB; prov. Muğla: Kizilyaka, 2001. V. 17., RG et RIB; Boncuk Dağı, Üzümlü, 2001. V. 19., RG et RIB; prov. Balikesir: Mt. Kapi Dağ, 400 m, Erdek, 2001. V. 29 - VI. 2., RG et RIB; prov. Denizli: 5 km W of Tavas, Keceliler, 2001. V. 17., RG et RIB; prov. Izmir: Bergama, Asklepiyon, 1984. V. 3., SZD; prov. Antalya: Güney, 1984. V. 10., SZD - General distribution: Pontic species. Occurrence: wide-spread and frequent.

Netocia (Potosia) cuprina transfuga (Schaufuss, 1882) - prov. Çorum: Bogazkale, 1000 m, 1996. VI. 26., SZD; prov. Amasya: Tasova, 300 m, 1996. VII. 8., SZD; prov. Çankiri: Susuz, 1200 m, 1996. VII. 9., SZD - General distribution: Balkan-Asianic subspecies. Occurrence: sporadic and frequent.

Netocia (Potosia) funebris (Gory et Percheron, 1833) - prov. Artvin: Okcular-valley, Şavşat, 1996. VI. 29., RI - General distribution: Caucasian-Turanian species. Occurrence: it is wide-spread in the North-East Turkey, but not frequent.

Netocia (Potosia) funesta (Ménétriés, 1836) - prov. Adana: Hieropolis, 1989. V. 27., RI et RA; prov. Kars: Mts. Ararat, 1989. VI. 4., RI; prov. Bitlis: Küçüksu, 1990. IV. 10., SZD; prov. Van: Gedikbulakköyü, 1990. IV. 11., SZD - General distribution: Caucasian-Anatolian species. Occurrence: wide-spread, but not frequent.

Netocia (Potosia) opaca (Fabricius, 1787) - prov. Adiyaman: Firat N., Karababa Köprü, 1990. IV. 8., SZD - General distribution: West-Mediterranean species. The subspecies Netocia opaca cretica (Kraatz, 1880) is found in Asia Minor by Baraud (1992).

Netocia (Potosia) splendidula (Faldermann, 1835) - prov. Kars: Mts. Ararat, 1989. VI. 4., RI et RA; Mts. Karasu-Aras, bank of Aras, 1989. VI. 5., RI; prov. Siirt: Çayan, 1989. V. 31., RI et RA; bank of Kahveci, 1989. V. 31., RI - General distribution: Caucasian species. Occurrence: it is wide-spread and frequent in East-Turkey.

Tropinota Mulsant, 1842

Tropinota hirta suturalis Reitter, 1913 - Sarican, 1990. V. 12., OA; prov. Bilecik: Mezit, 1987. V. 31., RI; prov. Afyon: Kunduzlu, 1987. V. 30., RI; prov. Sakarya: Esentepe, 1987. V. 11., RI; Kirkpinar, 1984. V. 20., RI; prov. Ankara: Akyarma-pass, 1500 m, near Aktas-river, 1987. V. 12., RI et RA; Yassihöyük, 1989. VI. 15., RI; Cigir, 1984. V. 19., SZD; prov. Amasya: Suluova, 1987. V. 16., RI; vil Sivas: Kizilli, 1987. V. 24., RI; 13 km E of Zara, 1987. V. 23., RI; Bank of Kizilirmak, 31 km E of Hafik, 1989. VI. 8., RI; prov. Çorlu: Çorlu, 1987. VI. 3., RI et RA; Lüleburgaz, 1987. V. 11., RI; prov. Yozgat: Disli, 1987. V. 24., RI; Derbent, 1989. VI. 10., RI; prov. Eskişehir: Paskandi, 1987. V. 28., RI et RA; Oglacki, 1987. V. 28., RI; Midas Şehri, 1989. VI. 12., RI; prov. Çorum: Alacahöyük, 1987. V. 15., RI; Sekerhacili, 1987. V. 15., RI et RA; Bogazkale, 1987. V. 14-16., RI; prov. Gümüşhane: Telme, 1987. V. 20., RI; Siran, 1987. V. 20., RI; prov. Edirne: Koru Dağ, 1989. V. 22., RI; Keşan, 1989. VI. 15., RI; Paşayiğit, 1984. V. 1., 1989. V. 21., RI et SZD; Kirçasalih, 1984. V. 1., RI; prov. Manisa: Sartmustafa, 1989. V. 24., RI; Sardes, 2001. V. 15., RG et RIB; prov. Uşak: Banaz, 1989. V. 24., RI; prov. Balikesir: Gündogan, 1989. VI. 15., RI; Mt. Kapi Dağ, 400 m, Ocaklar, 2001. V. 30., RG; prov. Içel: Mts. Taurus, 1600 m, Çamlyayla, 1984. V. 15., 1989. V. 27., RI et SZD; Mts. Taurus, Aladağ, 1984. V. 13., RI; Mts. Taurus, Ulaş, 1984. V. 14., RI; Mts. Ala Dağ, Kizilcahaman, 1400 m, 1983. VI. 19-21., GK; Yavca, 1984. V. 13., SZD; prov. Kars: Aras-valley, 1989. VI. 5., RI; prov. Nevşehir: Kappadokia, Kaymakli, 1984. V. 16., RI et SZD; Göreme, 1984. V. 16-17., RI et SZD; prov. Aydin: Isabeyli, 1984. V. 4., RI et RA; Umurlu, 1984. V. 4., SZD; prov. Tekirdağ: Muratli, 1984. V. 23., RI et RA; Nabiköy, 2001. VI. 5., RG; prov. Denizli: Çardak, 1984. V. 6., RI; prov. Izmir: Selçuk, Ephesos, 1984. V. 4., RI; Bergama, Pergamon, 1984. V. 3., RI, RA et SZD; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI; prov. Antalya: Kalediran, 1984. V. 10., RI et SZD; Güney, 1984. V. 10., SZD; prov. Siirt: Köprücek, 1989. V. 1., RI et RA; Kücüksu, 1989. VI. 1., RI; Kusgunkiran-pass, 1989. VI. 1., RI; prov. Erzincan: Basköy, 1989. VI. 7., RI; prov. Ağri: Meydandağı, 1989. VI. 2., RI; Sarican, 1990. IV. 12., SZD; prov. Adana: Kabasakal, 1990. IV. 3., SZD; Castabala, 1990. IV. 4., SZD; prov. Adiyaman: Narince, 1990. IV. 7., SZD; Firat N., Karababa Küprü, 1990. IV. 8., SZD; prov. Van: Gedikbulakköyü, 1990. IV. 11., SZD; prov. Kirklareli: Kuzulu Köyü, 500 m, 1996. VI. 24., SZD - General distribution: East-Mediterranean subspecies. Occurrence: very wide-spread and common.

Tropinota squalida squalida (Scopoli. 1783) - prov. Ankara: Çamlidere, 1200 m, 1996. VI. 24-25., RI; prov. Bursa: Gölyazi, 1989. VI. 15., RI; prov. Bilecik: 10 km S of Bözüyük, Daridere, 2001. V. 26., RG; prov. Izmir: Bergama, Asklepiyon, 1984. V. 3., SZD; prov. Aydin: Ortaklar, 1984. V. 6., SZD - General distribution: Circummediterranean species. Occurrence: wide-spread and very frequent.

Tropinota squalida pilosa Brullé, 1832 - prov. Edirne: 4 km N of Kesan, 2001. V. 12., RG et RIB; 20 km SE of Edirne, 109 m, 2006. IV. 16., RG et RIB; prov. Tekirdağ: Saray, 172 m, 2006. V. 11., RG et RIB; prov. Kirklareli: 20 km W of Vize, Erenzer, 231 m, 2006. V. 11., RG et RIB; 20 km SE of Kirklareli, Kizilcikdere, 205 m, 2006.V. 11., RG et RIB - General distribution: East-Mediterranean-African subspecies. Occurrence: it is wide-spread in the European-Turkey, and very frequent.

Oxythyrea Mulsant, 1842

Oxythyrea albopicta (Motschulsky, 1845) - Mts. Taurus, Namrun, Çamlyayla, 1400 m, 1983. VI. 20-30., GK - General distribution: Asianic-Turanian species. Occurrence: sporadic and rare.

Oxythyrea cinctella (Schaum, 1841) - prov. Içel: Mts. Taurus, Ulaş, 1984. V. 14., RI, RA et SZD; Anamur, 1984. V. 11., RI et RA; Korykos, 1984. V. 12., RI et RA; Mts. Taurus, Aladağ, 1984. V. 13., RI; Meselik, 1000 m, 1989. V. 27., RI et RA; Mts. Taurus, Çamlyayla, 1600 m, 1989. V. 27., RI et RA; Namrun, 1400 m, 1983. VI 20-30., GK; prov. Antalya: Güney, 1984. V. 10., RI et SZD; Kalediran, 1984. V. 10., RI et RA; Alanya, 1984. V. 9., RI, RA et SZD; 10 km N of Aksu, 2001. V. 23., RG et RIB; prov. Izmir: Bergama, Pergamon, 1984. V. 3., 1989. V. 23., RI, RA et SZD; 2001. V. 15., RG et RIB; prov. Ankara: Cigir, 1984. V. 19., RI; prov. Denizli: Pamukkale, Hierapolis, 1984. V. 5., RI, RA et SZD; 2001. V. 16-17., RG et RIB; 5 km W of Tavas, Keceliler, 2001. V. 17., RG et RIB; prov. Aydin: Isabeyli, 1984. V. 4., RI; Ortaklar, 1984. V. 4., SZD; prov. Eskişehir: Paskadni, 1987. V. 28., RI et RA; Oglacki, 1987. V. 28., RI et RA; Kirka, 1989. VI. 13., RI; Kaymaz, 1989. VI. 11., RI et RA; prov. Adana: Hieropolis, 1989. V. 27., RI et RA; prov. Adiyaman: Asagi Coplu Köyü, 1989. V. 29., RI; prov. Siirt: Çayan, 1989. V. 31., RI et RA; south shore of lake Van, 1989. VI. 1., RI; Kusgunküran-pass, 1989. VI. 1., RI et RA; prov. Kars: Karakurt, 1989. VI. 5., RI; Aras-valley, 1989. VI. 5., RI; Kagizman, 1989. VI. 5., RI; prov. Bursa: Gölyazi, 1989. VI. 15., RI et RA; prov. Balikesir: Gündogan, 1989. VI. 15., RI et RA; Ulukir, 1989. VI. 15., RI; Mts. Kapi Dağ, Erdek, 400 m, 2001. VI. 2., RG et RIB; prov. Edirne: Koru Dağ, 1989. V. 22., RI et RA; prov. Siirt: Sapur, Dinlemne Yeri, 1989. VI. 1., RI; prov. Erzurum: 11 km S of Uzundere, 1996. VI. 29., RI; prov. Erzincan: Tercan, 1500 m, 1996. VI. 28., RI; 46 km W of Tercan, 1200 m, 1996. VI. 28., RI; prov. Artvin: Okcular-valley, Şavşat, 1996. VI. 29., RI et SZD; Cam pass, 1600 m, 1996. VI. 30., SZD; prov. Çorum: Büyükincesu, 1996. VI. 26., RI et SZD; Sungurlu, 1996. VI. 25., RI; Osmancik, 450 m, 1996. VII. 8., RI et SZD; prov. Kastamonu: Tosya, 650 m, 1996. VII. 9., RI; prov. Çanakkale: Mt. Koru Dağ, Kocaçeşme, 2001. V. 12., RG et RIB; prov. Manisa: Sartmustafa, Sardes, 2001. V. 15., RG et RIB; 5 km SE of Manisa, 2001. V. 15., RG et RIB; 13 km N of Muradiye, 2001. V. 15., RG et RIB; prov. Muğla: Boncuk Dağı, Üzümlü, 2001. V. 19., RG et RIB; Kizilyaka, 2001. V. 17., RG et RIB; prov. Isparta: Sipahiler, 2001. V. 23., RG et RIB - General distribution: East-Mediterranean-Levantine species. Occurrence: very wide-spread and very common.

Oxythyrea funesta (Poda, 1761) - prov. Istambul: Silivri, 1984. V. 23., RI et RA; prov. Çorlu: Çorlu, 1987. VI. 3., RI et RA; prov. Kirklareli: Saricaali, 1987. VI. 3., RI; Kuzulu Köyü, 1996. VI. 24., RI; 20 km SE of Kirklareli, 240 m, 2006. V. 11., RG et RIB; 20 km W of Vize, Erzener, 231 m, 2006. V. 11., RG et RIB; prov. Edirne: Keşan, 1989. VI. 15., RI; Paşayiğit, 1989. V. 21., RI; Koru Dağ, 1989. V. 22., RI; prov. Balikesir: Ulukir, 1989. VI. 15., RI; Gündogan, 1989. VI. 15., RI; prov. Manisa: 5 km SE of Manisa, 2001. V. 15., RG et RIB; prov. Çanakkale: Gelibolu Yarimadasi, Bayirköy, 2001. V. 12., RG et RIB; prov. Izmir: Bergama, Asklepiyon, 1984. V. 3 - General distribution: Mediterranean species. Occurrence: wide-spread and common.

Summary

Between 1977 and 2006 researchers of the Hungarian Entomological Society conducted 9 collecting trips to Turkey. This paper contains a list of Lamellicornia species with collecting data, collected on these trips. 12 families, 64 genera, 270 species and subspecies are listed:

Genus	Number of Spcecies	
Lucanidae	3	3
Geotrupidae	5	7
Ochodaeidae	1	1
Aphodiidae	1	21
Scarabaeidae	8	24
Glaphyridae	2	9
Melolonthidae	9	12
Rutelidae	4	7
Dynastidae	2	2
Cetoniidae	7	13
Altogether:	**42**	**99**

The records of 20 species are new as previously published records of these don't exist. The newly recorded species are:

Aphodius (*Acrossus*) *gagatinus* Ménétriés, 1832
Aphodius (*Acrossus*) *planicollis* (Reitter, 1890)
Aphodius (*Biralus*) *equinus* (Faldermann, 1835)
Aphodius (*Chilothorax*) *pustulifer* Reitter, 1892
Aphodius (*Neagolius*) *abchasicus* Reitter, 1892
Aphodius (*Phalacronotus*) *citellorum* Semenov et Medvedev, 1929
Aphodius (*Plagiogonus*) *nanoides* (Balthasar, 1961)
Aphodius (*Pseudosymus*) *lucidus* Klug, 1845
Oxyomus silvestris (Scopoli, 1763)
Pleurophorus apicipennis Reitter, 1892
Rhyssemus algiricus meridionalis Reitter, 1901
Bubas bison (Linnaeus, 1767)
Onthophagus (*Palaeonthophagus*) *similis* (Scriba, 1790)
Onthophagus (*Palaeonthophagus*) *tesquorum* Semenov et Medvedev, 1929
Eulasia (*s.str.*) *arctos arctos* (Pallas, 1781)
Eulasia (*s.str.*) *korbi* (Petrovitz, 1972)
Homaloplia (*s.str.*) *ruricola ruricola* (Fabricius, 1775)
Hoplia caucasica Kolenati, 1846
Hoplia cylindrica Reitter, 1903
Hoplia pollinosa Krynicki, 1832

The further research of Turkey's Lamellicornia fauna may reveal more novelties regarding the distribution of species known from surrunding territories. We can anticipate new distribution records especially in East-Anatolia. The dispersion of Caucasian, Iranian and Syrian species is perceivable in this area.

Acknowledgement

We are indebted to Paul Schoolmeesters (Belgium), Denis Keith (France), László Ádám (Hungary), László Nádai (Hungary) for their assistance in determination, to Dezső Szalóki (Hungary) for allowing access to the data of his scarabaeoid collection and to György Hangay (Australia) for helping with the English translation of this article.

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DOI:10.24394/NatSom.2009.15.101

Natura Somogyiensis	15	101-112	Kaposvár, 2009

Adatok a kétújfalui (Baranya megye) vöröstölgyes bogárfaunájához (Coleoptera)

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Sár J., Merkl O. & Szalóki D.: D*ata to the beetle fauna of a planting of red oak in Kétújfalu (Hungary, Baranya county)(Coleoptera)*.
Abstract: A list of 300 species recorded from a planting of red oak (*Quercus rubra*) in Kétújfalu (Baranya county, Hungary; 10×10km UTM grid code YL09) is given. Five protected species (including two species of community interest listed in the Habitats Directive) were found. Fifty-five species are new to the area.

Key words: beetles, Coleoptera, faunistics, red oak, *Quercus rubra*.

Bevezetés

Kétújfalu és környékének (UTM-kód YL09) rendszeres bogárfaunisztikai vizsgálata 1986 óta folyik. Az eddig kimutatott 1595 fajt Sár & Merkl (2008) dolgozata foglalja össze. A jelen dolgozat egy kétújfalui vöröstölgyes bogárfaunájának közel két évig tartó felméréséről számol be.

A vöröstölgy (*Quercus rubra*) Észak-Amerika keleti felén, a mérsékelt-atlantikus részén elterjedt domb- és hegyvidéki faj. 1721 óta telepítik Európában. Magyarországon kb. 100 éve ültetik, főleg gyors növekedése és bőséges makktermése miatt. Hazánkban az Alföld kivételével szinte mindenütt megtalálható, nagyobb állományai vannak a Nyírségben, illetve a Dél-Dunántúlon és a nyugati határ mellett, ahol főleg gyertyános-tölgyesek helyére ültetik. Területaránya 1 százalék alatti.

A Magyarországon fellelhető vöröstölgyesek bogárfaunájának kutatására vonatkozó adatok nem találhatók a hazai szakirodalomban.

A gyűjtők a következők voltak: Sár József, Sár Péter és Szalóki Dezső.

A futóbogárfélék (Carabidae) fajait egy másik közlemény sorolja fel. A kimutatott bogárfajok bizonyító példányait a budapesti Magyar Természettudományi Múzeum Bogárgyűjteménye, Szalóki Dezső (Budapest) magángyűjteménye és a teklafalui Tequila Gyűjtemény őrzi.

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

Anyag és módszer

A vizsgált terület hossza 150, szélessége 70 méter. Kétújfalu és Teklafalu települések között helyezkedik el, közigazgatásilag Kétújfaluhoz tartozik. A középkorú vöröstölgyesben őshonos (ezüsthárs, fűz, fehér nyár), illetve betelepített fafajok (akác, feketefenyő) is fellelhetők. A terület minél teljesebb bogarászati felmérése érdekében (a talajszinttől a lombozatig) a következő gyűjtőmódszereket alkalmaztuk:

– ecetes talajcsapda;
– rostálás;
– egyelés (talajról, gombából, zuzmóból, kövek alól, dögről);
– gyűjtés fakéreg alól és korhadt fából;
– fűhálózás;
– kopogtatás;
– lámpázás (2009. július 10–11.);
– boros-banános csapdák, melyet a vöröstölgyek törzsén, illetve ágain 5 m magasságban helyeztünk el (2008. május-június);
– hangyafészkek vizsgálata (egyelés, fehér tálas válogatás, rostálás).

Eredmények

A gyűjtött anyagból 299 fajt sikerült azonosítani, közülük SÁR & MERKL (2008) dolgozatát alapul véve 55 faj a területről most került elő első ízben. A kimutatott fajok többsége Magyarország nagy részén elterjedt, gyakori bogár, a vöröstölgyhöz közvetlenül nem kötődik, ezért felmérésünket célszerű a hazai vöröstölgyesek kutatásának előfutáraként tekinteni. Az előkerült 5 védett faj, köztük 2 közösségi jelentőségű faj (Natura 2000 jelölőfaj) felsorolása az 1. táblázatban látható. Faunisztikai szempontból figyelemre méltónak az alábbi fajok tekinthetők.

Aleochara laticornis Kraatz, 1856 (Staphylinidae) – Meleg, száraz éghajlatú területeken fordul elő, Közép-Európában csak a délebbi részeken található. Magyarországon nagyon szórványos és elég ritka. Leginkább dögön lehet gyűjteni, de példányainak többsége (rendszerint egyesével, soha nem nagyobb számban) talajcsapdázások anyagából és húscsalétekről került elő.

Placusa adscita Erichson, 1839 (Staphylinidae) – Melegkedvelő, elsősorban tölgyesekben él. Leginkább boroscsapdával gyűjthető, ezért Magyarországról csak kevés példánya ismert.

Rhizophagus aeneus Richter, 1820 (Monotomidae) – Lombhullató erdők ritkasága. A területen kéreg alól került elő. Néhány hazai lelőhelyét MERKL (1996) sorolja fel.

Aulonium ruficorne (Olivier, 1790) (Zopheridae) – Fenyők kérge alatt, szúbogarak járatában élő faj. Hazánkban ritka; Kétújfalun kívül eddig a következő lelőhelyekről ismerjük: Baranya megye: Pécs, gyűjtési idő ismeretlen (valószínűleg a 20. század első évei), leg. Ehmann Ferenc; Pécs, gyűjtési idő ismeretlen (valószínűleg a 20. század első évei), leg. Kaufmann Ernő. Somogy megye: Kaposvár, 1963.V.26., leg. Nattán Miklós; Nikla, Debella, Pinus sylvestris kérge alól, 2004.III.30., leg. Szalóki Dezső; Somogyszob: Baláta-tó, 1955.VI., leg. Lenci Rudolf. Tolna megye: Paks, Cseresznyés, erdeifenyő homokon, kiszáradt fenyő kérge alól, 2008.XII.2., leg. Grabant Aranka, Kotán Attila, Merkl Ottó, Németh Tamás & Somay László. Veszprém megye: Bakonypölöske, 1954.

1. táblázat: A területről kimutatott védett bogárfajok

Magyar név	Latin név	Pénzben kifejezett érték (Ft)	Natura 2000 jelölőfaj	Berni Egyezmény	IUCN Vörös Lista
kis szarvasbogár	*Dorcus parallelipipedus*	2000			
skarlátbogár	*Cucujus cinnaberinus*	2000	X	II. függelék	VU A1c
hosszúcsápú szalmacincér	*Calamobius filum*	2000			
nagy hőscincér	*Cerambyx cerdo*	10000	X	II. és IV. függelék	VU A1c2c
hengeres szalmacincér	*Theophilea subcylindricollis*	2000			

VIII., leg. Lenci Rudolf; Balatonakali: Becce, fenyves, kéreg alól, 2009.IV.21., leg. Nádai László & Németh Tamás; Balatonakali: Becce, fenyves, kéreg alól, 2009.V.1., leg. Katona Eszter, Merkl Ottó, Németh Tamás & Soltész Zoltán; Bakony, közelebbi lelőhelyadat nélkül, 1937.III.19., leg. Erdős József.

Az előkerült bogárfajok felsorolása

A családok LAWRENCE & NEWTON (1995) és a Fauna Europaea (2004) sorrendjét követik, a családokon belül a fajok ABC-sorrendben következnek egymás után. A „területre új" kifejezés azokat a fajokat jelöli, amelyek először kerültek elő Kétújfalu és Teklafalu területéről, így adataik SÁR & MERKL (2008) dolgozatában még nem szerepelhettek. Csillag (*) jelöli azokat a fajokat, amelyeket egyértelműen a vöröstölgyön találtunk. Az egyes családok esetében azokat a személyeket tüntettük fel meghatározóként, akik a példányok többségét azonosították.

Dytiscidae (meghatározta: Merkl Ottó)
Hydroglyphus geminus (Fabricius, 1792) – 2009.V.2., 2008.V.14.

Hydrophilidae (meghatározta: Szél Győző)
Cercyon convexiusculus Stephens, 1792 – 2009.V.14. (területre új)

Histeridae (meghatározta: Merkl Ottó)
Acritus minutus (Herbst, 1792) – 2009.IV.4.
Eblisia minor (Rossi, 1792) – 2009.IV.11.
Epierus comptus Erichson, 1834 – 2009.IV.4.
Gnathoncus nannetensis (Marseul, 1862) – 2009.IV.25.
Hololepta plana (Sulzer, 1776) – 2008.II.18.
Margarinotus merdarius (Hoffmann, 1803) – 2009.VI.14.
Onthophilus punctatus (O. F. Müller, 1776) – 2009.IV.9.
Paromalus flavicornis (Herbst, 1792) – 2009.IV.10., 2009.V.23.
Paromalus parallelepipedus (Herbst, 1792) – 2009.IV.18. (területre új)
Platysoma elongatum (Thunberg, 1787) – 2009.IV.18. (területre új)
**Platysoma compressum* (Herbst, 1783) – 2008.II.10., 2009.IV.4.

Leiodidae (meghatározta: Merkl Ottó)
Anisotoma humeralis (Fabricius, 1792) – 2009.VI.27.
Catops neglectus Kraatz, 1852 – 2009.V.15. (területre új)
Colenis immunda (Sturm, 1807) – 2009.VI.1., 2009.VI.12. (területre új)
Fissocatops westi (Krogerus, 1931) – 2009.IV.25.
Nargus anisotomoides (Spence, 1815) – 2008.V.6., 2009.IV.25., 2009.IV.28., 2009.V.6., 2009.V.15., 2009.V.16.
Nargus velox (Spence, 1815) – 2009.V.16.
Nargus wilkini (Spence, 1815) – 2009.IV.3.
Sciodrepoides watsoni (Spence, 1815) – 2008.V.1., 2009.IV.18., 2009.V.1., 2009.V.15.

Silphidae (meghatározta: Merkl Ottó)
Nicrophorus humator (Gleditsch, 1767) – 2009.V.16.
Nicrophorus vespilloides Herbst, 1784 – 2009.V.16.
Oiceoptoma thoracicum (Linnaeus, 1758) – 2009.IV.9.
Phosphuga atrata (Linnaeus, 1758) – 2009.III.9., 2009.VI.25.
Silpha obscura Linnaeus, 1758 – 2009.V.2. (területre új)
Thanatophilus sinuatus (Fabricius, 1775) – 2009.VI.10 (területre új)

Staphylinidae (meghatározta: Makranczy György és Merkl Ottó)
Abemus chloropterus (Panzer, 1796) – 2009.IV.25.
Acrotona piceorufa (Mulsant et Rey, 1873) – 2009.IV.28.
Aleochara curtula (Goeze, 1777) – 2009.V.15., 2009.VI.22.
Aleochara laticornis Kraatz, 1856 – 2009.IV.2. (területre új)
Aleochara sparsa Heer, 1839 – 2009.IV.3., 2009.V.2., 2009.V.15., 2009.VI.22.
Anotylus inustus (Gravenhorst, 1806) – 2009.IV.25., 2009.V.2.
Anthobium atrocephalum (Gyllenhal, 1827) – 2009.IV.10., 2009.IV.25., 2009.V.6.
Atheta crassicornis (Fabricius, 1792) – 2009.IV.6.
Atheta euryptera (Stephens, 1832) – 2009.IV.3., 2009.IV.25., 2009.V.2., 2009.V.9., 2009.V.15.
Atheta gagatina (Baudi di Selve, 1848) – 2009.IV.3., 2009.V.15. (területre új)
Atheta sodalis (Erichson, 1837) – 2009.V.15.
Atheta vaga (Heer, 1839) – 2009.V.2. (területre új)
Bolitochara lucida (Gravenhorst, 1802) – 2009.IV.6.
Coprophilus striatulus (Fabricius, 1793) – 2009.IV.25., 2009.V.15.
Cordalia obscura (Gravenhorst, 1802) – 2009.IV.1.
Drusilla canaliculata (Fabricius, 1787) – 2009.V.15.
Gabrius osseticus (Kolenati, 1846) – 2009.IV.25., 2009.IV.28., 2009.V.15.
Gabrius splendidulus (Gravenhorst, 1802) – 2009.V.6.
Gyrophaena affinis Mannerheim, 1830 – 2009.V.15., 2009.VI.25. (területre új)
Gyrophaena joyioides Wüsthoff, 1937 – 2009.V.15.
Gyrophaena manca Erichson, 1839 – 2009.III.9. (területre új)
Hypnogyra angularis (Ganglbauer, 1895) – 2009.IV.1., 2009.IV.9.
Liogluta longiuscula (Gravenhorst, 1802) – 2009.IV.1., 2009.IV.28., 2009.V.6., 2009.V.15.
Lordithon trinotatus (Erichson, 1839) – 2009.IV.3. (területre új)
Micropeplus marietti Jacquelin du Val, 1857 – 2009.V.15.
Mycetoporus erichsonanus Fagel, 1965 – 2009.IV.25.
Ocypus nitens (Schrank, 1781) – 2009.V.9.
Ocypus olens (Müller, 1764) – 2009.V.21.
Omalium caesum Gravenhorst, 1806 – 2009.V.6.
Omalium rivulare (Paykull, 1789) – 2009.IV.25., 2009.V.15.
Ontholestes haroldi (Eppelsheim, 1884) – 2009.IV.2., 2009.IV.3.
Oxypoda acuminata (Stephens, 1832) – 2009.IV.25., 2009.IV.28.
Pella humeralis (Gravenhorst, 1802) – 2009.IV.25.
Philonthus mannerheimi Fauvel, 1869 – 2009.V.15.
Phloeostiba plana (Paykull, 1792) – 2009.IV.3., 2009.IV.25., 2009.IV.26., 2009.V.15. (területre új)

Placusa adscita Erichson, 1839 – 2009.IV.25. (területre új)
Platydracus chalcocephalus (Fabricius, 1801) – 2009.IV.2., 2009.V.15. (területre új)
Proteinus ovalis Stephens, 1834 – 2009.IV.26. (területre új)
Rugilus rufipes (Germar, 1836) – 2009.V.15.
Sepedophilus marshami (Stephens, 1832) – 2009.V.6.
Sepedophilus testaceus (Fabricius, 1793) – 2009.IV.6., 2009.IV.25., 2009.V.9.
Stenus ludyi Fauvel, 1886 – 2009.IV.25.
Tachinus corticinus Gravenhorst, 1802 – 2009.IV.3.
Velleius dilatatus (Fabricius, 1787) – 2009.VI.22. (területre új)
Claviger testaceus Preyssler, 1790 – 2009.V.17., 2009.V.20.
**Scaphidium quadrimaculatum* Olivier, 1790 – 2009.III.9., 2009.IV.2., 2009.V.2.
Scaphisoma agaricinum (Linnaeus, 1758) – 2009.III.30., 2009.IV.9., 2009.IV.10., 2009.IV.11., 2009.IV.25., 2009.V.16., 2009.V.17., 2009.VI.1., 2009.VI.25.
Scaphium immaculatum (Olivier, 1790) – 2009.V.20.

Lucanidae (meghatározta: Sár József)
**Dorcus parallelipipedus* (Linnaeus, 1758) – 2009.V.20.

Trogidae (meghatározta: Merkl Ottó)
Trox sabulosus (Linnaeus, 1758) – 2009.IV.25.

Geotrupidae (meghatározta: Sár József)
Anoplotrupes stercorosus (Scriba, 1791) – 2009.VI.25.

Scarabaeidae (meghatározta: Merkl Ottó és Sár József)
Aphodius biguttatus Germar, 1824 – 2008.V.6. (területre új)
Cetonia aurata (Linnaeus, 1761) – 2008.VI.25., 2009.IV.9., 2009.V.5., 2009.V.27.
**Melolontha melolontha* (Linnaeus, 1758) – 2009.V.2., 2009.V.11.
Onthophagus coenobita (Herbst, 1783) – 2009.IV.26., 2009.V.5., 2009.V.16., 2009.VI.23.
Onthophagus ovatus (Linnaeus, 1767) – 2009.IV.2., 2009.IV.25.
Oxythyrea funesta (Poda, 1761) – 2009.VI.27.
Pleurophorus caesus (Creutzer.1796) – 2009.V.23., 2009.VI.23.
Rhyssemus germanus (Linnaeus, 1758) – 2009.VI.25.
Serica brunnea (Linnaeus, 1758) – 2009.VI.23.
Tropinota hirta (Poda, 1761) – 2009.IV.11.

Buprestidae (meghatározta: Németh Tamás és Sár József)
Agrilus graminis Kiesenwetter, 1857 – 2008.V.30.
Anthaxia fulgurans (Schrank, 1789) – 2009.V.27. (területre új)
**Chrysobothris affinis* (Fabricius, 1794) – 2008.V.30.

Byrrhidae (meghatározta: Merkl Ottó)
Byrrhus pilula (Linnaeus, 1758) – 2009.IV.24.
Curimopsis paleata (Erichson, 1846) – 2009.IV.25. (területre új)
Lamprobyrrhulus nitidus (Schaller, 1783) – 2009.IV.25.

Throscidae (meghatározta: Szalóki Dezső)
Trixagus carinifrons (Bonvouloir, 1859) – 2009.V.6.
Trixagus elateroides (Heer, 1841) – 2009.IV.10., 2009.V.6.

Elateridae (meghatározta: Németh Tamás)
Agriotes ustulatus (Schaller, 1783) – 2009.V.14. (területre új)
Agrypnus murimus (Linnaeus, 1758) – 2009.V.11., 2009.VI.2.
Ampedus cinnabarinus (Eschscholtz, 1829) – 2009. III. 9.
Ampedus elongatulus Fabricius, 1787 – 2009.IV.10., 2009. V. 1., 2009. V. 25.

Ampedus rufipennis (Stephens, 1830) – 2009. III. 9., 2009.IV.10., 2009. V. 1.
Ampedus sanguinolentus (Schrank, 1776) – 2009. III. 9., 2009. VI. 11.
Athous bicolor (Goeze, 1777) – 2009.V.20.
Athous haemorrhoidalis (Fabricius, 1801) – 2009. V. 6., 2009. V. 9.
Athous vittatus (Fabricius, 1792) – 2009.III.30.,2009. V. 6., 2009. V. 9.
Cidnopus pilosus (Leske, 1785) – 2009. VI. 9.
Dicronychus cinereus (Herbst, 1784) – 2009.III.30.
**Drapetes cinctus* (Panzer, 1796) – 2008.VI.10.
Drasterius bimaculatus (Rossi, 1790) – 2009.IV.10.
Nothodes parvulus (Panzer, 1799) – 2009.III.30., 2009. V. 1., 2009. V. 9., 2009.V.20.

Cantharidae (meghatározta: Szalóki Dezső)
Cantharis fusca Linnaeus, 1758 – 2009.VI.27.
Cantharis livida Linnaeus, 1758 – 2009.V.2.
Cantharis rustica Fallén, 1807 – 2009.V.2., 2009.V.9.
Rhagonycha lignosa (O. F. Müller, 1764) – 2009.V.2.

Nosodendridae (meghatározta: Merkl Ottó)
Nosodendron fasciculare (Olivier, 1790) – 2009.III.30.

Dermestidae (meghatározta: Merkl Ottó)
Anthrenus pimpinellae pimpinellae Fabricius, 1775 – 2009.IV.11.
Anthrenus scrophulariae scrophulariae (Linnaeus, 1758) – 2008.V.19.
Anthrenus verbasci (Linnaeus, 1767) – 2008.V.19.
Attagenus pellio (Linnaeus, 1758) – 2008.V.19., 2009.V.1.
Dermestes frischii (Kugelann, 1792) – 2009.VI.10.
Trogoderma glabrum (Herbst, 1783) – 2008.V.17.

Ptinidae (meghatározta: Merkl Ottó)
Ptinus calcaratus Kiesenwetter, 1877 – 2009.V.15., 2009.VI.2.
Ptinus fur (Linnaeus, 1758) – 2009.IV.19.

Trogossitidae (meghatározta: Szalóki Dezső)
**Tenebrioides mauritanicus* (Linnaeus, 1758) – 2009.III.9., 2009.VI.10.

Malachiidae (meghatározta: Szalóki Dezső)
Clanoptilus geniculatus (Germar, 1824) – 2009.V.30.
Malachius bipustulatus (Linnaeus, 1758) – 2009.V.2.

Dasytidae (meghatározta: Szalóki Dezső)
Dasytes aeratus Stephens, 1830 – 2009.V.6.
Dasytes plumbeus (O. F. Müller, 1776) – 2009.V.2., 2009.V.6.
Dolichosoma lineare (Rossi, 1792) – 2009.V.2., 2009.V.14., 2009.VI.10., 2009.V.20., 2009.V.30.

Nitidulidae (meghatározta: Merkl Ottó)
Amphotis marginata (Fabricius, 1781) – 2009.VI.23.
Carpophilus bipustulatus (Heer, 1841) – 2009.IV.25. (területre új)
Cryptarcha strigata (Fabricius, 1787) – 2009.IV.25. (területre új)
**Epuraea guttata* (Olivier, 1811) – 2009.V.1.
**Epuraea limbata* (Fabricius, 1787) – 2009.V.16.
Glischrochilus quadrisignatus (Say, 1835) – 2009.IV.2., 2009.IV.25., 2009.V.9., 2009.VI.22., 2009.VI.23.
Nitidula carnaria (Schaller, 1783) – 2009.VI.25.
Omosita discoidea (Fabricius, 1775) – 2009.III.9.
Pityophagus ferrugineus (Linnaeus, 1761) – 2009.V.1. (területre új)
Soronia grisea (Linnaeus, 1758) – 2009.III.30., 2009.IV.9., 2009.IV.25.

Soronia punctatissima (Illiger, 1794) – 2009.VI.12.
Stelidota geminata (Say, 1825) – 2009.V.6., 2009.V.16. (területre új)
Thalycra fervida (Olivier, 1790) – 2009.III.30.
Urophorus rubripennis (Heer, 1841) – 2009.III.30.

Monotomidae (meghatározta: Merkl Ottó)
**Rhizophagus aeneus* Richter, 1820 – 2009.IV.25. (területre új)
Rhizophagus bipustulatus (Fabricius, 1792) – 2009.III.30., 2009.IV.25., 2009.V.1.
Rhizophagus parallelocollis (Gyllenhal, 1827) – 2009.V.1. (területre új)

Silvanidae (meghatározta: Merkl Ottó)
**Silvanus bidentatus* (Fabricius, 1792) – 2009.II.13.
**Silvanus unidentatus* (Olivier, 1790) – 2009.V.23., 2009.II.13.
**Uleiota planatus* (Linnaeus, 1761) – 2008.V.6., 2009.II.13., 2009.III.9.

Cucujidae (meghatározta: Sár József)
**Cucujus cinnaberinus* (Scopoli, 1763) – 2008.II.18.

Laemophloeidae (meghatározta: Merkl Ottó)
Cryptolestes duplicatus (Waltl, 1839) – 2009.IV.10.
Placonotus testaceus (Fabricius, 1787) – 2009.IV.10.

Erotylidae (meghatározta: Merkl Ottó)
Dacne bipustulata (Thunberg, 1781) – 2009.III.9., 2009.V.6., 2009.V.16., 2009.V.17., 2009.VI.14., 2009.V.23.
Tritoma bipustulata Fabricius, 1775 – 2009.IV.26., 2009.V.6.

Byturidae (meghatározta: Merkl Ottó)
Byturus ochraceus (Scriba, 1790) – 2009.III.30.

Biphyllidae (meghatározta: Merkl Ottó)
Diplocoelus fagi (Chevrolat, 1837) – 2009.V.1. (területre új)

Bothrideridae (meghatározta: Sár József)
**Bothrideres bipunctatus* (Gmelin, 1790) – 2009.IV.18., 2009.VI.25.

Cerylonidae (meghatározta: Merkl Ottó)
**Cerylon ferrugineum* Stephens, 1830 – 2009.III.9.
**Cerylon histeroides* (Fabricius, 1792) – 2009.III.9., 2009.IV.9.,2009.IV.10., 2009.IV.28., 2009.V.16., 2009.VI.1., 2009.VI.25.

Coccinellidae (meghatározta: Merkl Ottó)
Coccinula quatuordecimpustulata (Linnaeus, 1758) – 2008.V.14. (területre új)
Cynegetis impunctata (Linnaeus, 1767) – 2008.V.2. (területre új)
Hippodamia variegata (Goeze, 1777) – 2008.V.14.
Propylea quatuordecimguttata (Linnaeus, 1758) – 2008.V.6., 2009.VI.14.
Psyllobora vigintiduopunctata (Linnaeus, 1758) – 2009.IV.11. (területre új)
Scymnus ferrugatus (Moll, 1785) – 2009.IV.18.
Scymnus suffrianioides apetzoides Capra et Fürsch, 1967 – 2009.V.30., 2009.VI.14. (területre új)
Stethorus pusillus Herbst, 1797 – 2008.V.6., 2009.IV.28. (területre új)
Subcoccinella vigintiquatuorpunctata (Linnaeus, 1758) – 2009.V.30., 2009.VI.14.

Corylophidae (meghatározta: Merkl Ottó)
Arthrolips obscura (C. R. Sahlberg, 1833) – 2009.V.6. (területre új)
Clypastraea brunnea (C. Brisout de Barneville, 1863) – 2009.V.6. (területre új)
Clypastraea reitteri Bowestead, 1999 – 2009.V.6. (területre új)

Latridiidae (meghatározta: Merkl Ottó)
Cartodere nodifer (Westwood, 1839) – 2009.IV.9. (területre új)

Mycetophagidae (meghatározta: Szalóki Dezső)
Litargus connexus (Geoffroy, 1785) – 2009.IV.10., 2009.IV.18., 2009.V.6.
Mycetophagus multipunctatus Fabricius, 1792 – 2009.IV.18., 2008.V.1.
**Mycetophagus quadripustulatus* (Linnaeus, 1761) – 2009.V.6., 2009.V.16., 2009.V.17.
Mycetophagus piceus (Fabricius, 1777) – 2009.IV.11., 2009.IV.18., 2009.V.16.

Ciidae (meghatározta: Merkl Ottó)
Cis boleti (Scopoli, 1763) – 2008.V.1., 2009.III.30., 2009.IV.9.,2009.IV.10., 2009.IV.11., 2009.IV.26.
Cis fagi Waltl, 1839 – 2009.IV.18., 2009.V.6. (területre új)
Cis micans (Fabricius, 1792) (= hispidus Paykull, 1798) – 2009.V.15. (területre új)
Cis submicans Abeille de Perrin, 1874 – 2009.III.9., 2009.IV.26.
Ennearthron cornutum (Gyllenhal, 1827) – 2009.IV.18. (területre új)
Orthocis alni (Gyllenhal, 1813) – 2008.V.6.
Orthocis vestitus (Mellié, 1848) – 2009.IV.4. (területre új)
Sulcacis nitidus (Fabricius, 1792) (= *affinis* Gyllenhal, 1827) – 2009.III.30., 2009.IV.10., 2009.V.15.

Mordellidae (meghatározta: Merkl Ottó)
Mordellistena neuwaldeggiana (Panzer, 1796) – 2009.IV.14.
Mordellochroa abdominalis (Fabricius, 1775) – 2009.V.14. (területre új)

Zopheridae (meghatározta: Merkl Ottó és Szalóki Dezső)
Aulonium ruficorne (Olivier, 1790) – 2009.IV.15., 2009.IV.18. (területre új)
**Bitoma crenata* (Fabricius, 1775) – 2009.IV.4., 2009.IV.10., 2009.IV.11.
**Pycnomerus tenebrans* (Olivier, 1790) – 2009.VI.25.

Tenebrionidae (meghatározta: Merkl Ottó és Szalóki Dezső)
Alphitophagus bifasciatus (Say, 1823) – 2009.IV.5.
Corticeus bicolor (Olivier, 1790) – 2009.V.23.
Corticeus longulus (Gyllenhal, 1827) – 2009.IV.10., 2009.IV.18. (területre új)
Corticeus unicolor Piller et Mitterpacher, 1783 – 2009.IV.4., 2009.VI.25.
Diaclina fagi (Panzer, 1799) – 2009.IV.4.
Diaperis boleti (Linnaeus, 1758) – 2009.III.9., 2009.V.16.
Eledona agricola (Herbst, 1783) – 2009.IV.18.
**Palorus depressus* (Fabricius, 1790) – 2009.III.9., 2009.V.23.
**Palorus subdepressus* (Wollaston, 1864) – 2009.VI.25.
**Platydema violaceum* (Fabricius, 1790) – 2009.VI.10.
**Scaphidema metallicum* (Fabricius, 1792) – 2008.V.6., 2009.VI.10.
**Stenomax aeneus* (Scopoli, 1763) – 2009.IV.10.
**Uloma culinaris* (Linnaeus, 1758) – 2009.III.9., 2009.IV.10., 2009.IV.11., 2009.VI.27.

Oedemeridae (meghatározta: Szalóki Dezső)
Oedemera femorata (Scopoli, 1763) – 2009.V.14., 2009.V.20., 2009.V.30.
Oedemera lurida (Marsham, 1802) – 2009.V.14., 2009.V.20., 2009.V.30.
Oedemera podagrariae (Linnaeus, 1767) – 2009.V.14., 2009.V.30.
Oedemera virescens (Linnaeus, 1767) – 2009.VI.10

Meloidae (meghatározta: Szalóki Dezső)
Cerocoma schreberi Fabricius, 1781 – 2008.VI.12., 2009.V.30.

Pyrochroidae (meghatározta: Szalóki Dezső)
**Pyrochroa serraticornis* (Scopoli, 1763) – 2009.V.2., 2009.V.6.

Salpingidae (meghatározta: Szalóki Dezső)
Lissodema cursor (Gyllenhal, 1813) – 2009.V.6.
Lissodema denticolle (Gyllenhal, 1813) – 2008.V.6., 2009.IV.10., 2009.V.19., 2009.VI.25.
Vincenzellus ruficollis (Panzer, 1794) – 2009.V.6. (területre új)

Anthicidae (meghatározta: Szalóki Dezső)
Notoxus monocerus (Linnaeus, 1761) – 2009.VI.10., 2009.V.20.
**Pseudotomoderus compressicollis* (Motschulsky, 1839) – 2009.V.6., 2009.V.10.

Scraptiidae (meghatározta: Merkl Ottó)
Anaspis frontalis (Linnaeus, 1758) – 2008.V.2. (területre új)

Cerambycidae (meghatározta: Sár József)
Agapanthia cardui (Linnaeus, 1767) – 2009.V.30.
Calamobius filum (Rossi, 1790) – 2009.V.30.
**Cerambyx cerdo* (Linnaeus, 1758) – 2008.V.22.
**Cerambyx scopolii* Fuessly, 1775 – 2008.V.6., 2009.VI.11.
Cortodera humeralis (Schaller, 1783) – 2008.V.6.,
Cortodera villosa Heyden, 1876 – 2008.V.19.,
Grammoptera ruficornis (Fabricius, 1781) – 2008.V.19.
Leiopus nebulosus (Linnaeus, 1758) – 2008.V.6.
Pachytodes cerambyciformis (Schrank, 1781) – 2008.V.22.
Pachytodes erraticus (Dalman, 1817) – 2008.V.22, 2008.V.1.
**Pyrrhidium sanguineum* (Linnaeus, 1758) – 2009.V.25., 2009.VI.2.
Rhagium inquisitor (Linnaeus, 1758) – 2008.IV.22. (területre új)
Rutpela maculata (Poda, 1761) – 2009.VI.25.
Stenopterus flavicornis Küster, 1846 – 2009.VI.27.
Stenopterus rufus Linnaeus, 1767 – 2009.V.30.
Stenurella bifasciata (Müller, 1776) – 2008.V.14. (területre új)
Stenurella melanura (Linnaeus, 1758) – 2009.VI.25.
**Stenurella nigra* (Linnaeus, 1758) – 2008.V.19.
Stenurella septempunctata (Fabricius, 1752) – 2009.VI.25.
Stictoleptura rubra (Linnaeus, 1758) – 2009.VI.25.
Strangalia attenuata (Linnaeus, 1758) – 2009.VI.27.
Theophilea subcylindricollis Hladil, 1988 – 2009.VI.10.

Chrysomelidae (meghatározta: Merkl Ottó és Vig Károly)
Chaetocnema aridula (Gyllenhal, 1827) – 2008.V.14. (területre új)
Chaetocnema compressa (Letzner, 1846) – 2009.V.2.
Chaetocnema concinna (Marsham, 1802) – 2009.V.2.
Chaetocnema conducta (Motschulsky, 1838) – 2009.V.2., 2009.V.14., 2009.V.17.
Chaetocnema major (Jacquelin du Val, 1852) – 2008.V.14.
Chrysomela populi Linnaeus, 1758 – 2009.VI.10.
Cryptocephalus pusillus Fabricius, 1776 – 2009.V.2.
Cryptocephalus sericeus sericeus (Linnaeus, 1758) – 2009.V.2.
Cryptocephalus transiens Franz, 1949 – 2008.V.14.
Hypocassida subferruginea Schrank, 1776 – 2009.V.30.
Labidostomis longimana (Linnaeus, 1761) – 2008.V.14.
Lema cyanella (Linnaeus, 1758) – 2009.VI.27.
Longitarsus nigrofasciatus (Goeze, 1777) – 2009.V.2.
Phratora vitellinae (Linnaeus, 1758) – 2009.V.2., 2009.V.23.
Phyllotreta astrachanica Lopatin, 1977 – 2009.V.2.
Phyllotreta cruciferae (Goeze, 1777) – 2009.V.2.
Phyllotreta ochripes (Curtis, 1837) – 2009.V.2.
Phyllotreta vittula (Redtenbacher, 1849) – 2009.IV.2., 2009.V.2.

Psylliodes attenuatus (Koch, 1803) – 2009.V.2.
Smaragdina aurita (Linnaeus, 1767) – 2009.V.2.
Smaragdina salicina (Scopoli, 1763) – 2009.V.2.

Bruchidae (meghatározta: György Zoltán)
Acanthoscelides pallidipennis (Motschulsky, 1874) – 2009.V.14., 2009.V.2., 2009.V.20.
Bruchus occidentalis Lukjanovich et Ter-Minassian, 1957 – 2009.V.2.
*Spermophagus sericeu*s (Geoffroy, 1785) – 2009.V.20. (területre új)

Anthribidae (meghatározta: Podlussány Attila)
Anthribus nebulosus Forster, 1771 – 2009.V.2., 2009.V.20.
**Platystomos albinus* (Linnaeus, 1758) – 2009.IV.22.

Apionidae (meghatározta: Podlussány Attila)
Eutrichapion punctigerum (Paykull, 1792) – 2009.IV.2., 2009.V.14.
Oxystoma craccae (Linné, 1767) – 2009.V.30.

Curculionidae (meghatározta: Podlussány Attila)
Acalyptus sericeus Gyllenhal, 1836 – 2009.VI.25.
Archarius pyrrhoceras (Marsham, 1802) – 2009.V.2. (területre új)
Brachysomus hirtus (Boheman, 1845) – 2009.IV.10., 2009.IV.13., 2009.IV.25.
Ceutorhynchus obstrictus (Marsham, 1802) – 2009.V.30.
Ceutorhynchus pallidactylus (Marsham, 1802) – 2009.IV.2.
Coeliastes lamii (Fabricius, 1792) – 2009.IV.9., 2009.V.2.
Curculio glandium Marsham, 1802 – 2009.V.3.
Cyphocleonus dealbatus (Gmelin, 1790) – 2009.V.30.
Dodecastichus inflatus (Gyllenhal, 1834) – 2009.V.2.
Dorytomus ictor (Herbst, 1795) – 2009.IV.9.
Eusomus ovulum Germar, 1824 – 2009.IV.25., 2009.V.27., 2009.V.30.
Larinus planus (Fabricius, 1792) – 2009.V.30.
Larinus sturnus (Schaller, 1783) – 2009.V.30.
Mecinus pascuorum (Gyllenhal, 1813) – 2009.V.14.
Nedyus quadrimaculatus (Linné, 1758) – 2009.IV.25.
Otiorhynchus ovatus (Linné, 1758) – 2009.IV.25., 2009.V.2., 2009.V.20.
Otiorhynchus raucus (Fabricius, 1776) – 2009.V.6.
**Phyllobius argentatus* (Linnaeus, 1758) – 2009.IV.9., 2009.IV.25., 2009.V.1., 2009.V.2., 2009.V.6., 2009.V.20., 2009.V.27.
Phyllobius pallidus (Fabricius, 1792) – 2009.IV.9., 2009.V.20.
Phyllobius pyri (Linné, 1758) – 2009.V.2., 2009.V.30.
Polydrusus picus (Fabricius, 1792) – 2009.V.6., 2009.V.27.
Polydrusus tereticollis (DeGeer, 1775) – 2009.IV.25., 2009.V.1., 2009.V.2., 2009.V.6., 2009.V.27.
Polydrusus tibialis Gyllenhal, 1834 – 2009.IV.25., 2009.V.6., 2009.V.20., 2009.V.27.
Pseudorchestes ermischi (Dieckmann, 1958) – 2009.V.30. (területre új)
Rhyncolus elongatus (Gyllenhal, 1827) – 2009.V.3., 2009.VI.25.
Sitophilus zeamais Motschulsky, 1855 – 2009.V.1.
Stereonychus fraxini (DeGeer, 1775) – 2009.V.20.
Tychius cuprifer (Panzer, 1799) – 2009.V.6.
Tychius picirostris (Fabricius, 1787) – 2009.V.30.
Tychius quinquepunctatus (Linné, 1758) – 2009.V.27.

Scolytidae (meghatározta: Podlussány Attila)
Hylesinus fraxini (Panzer, 1799) – 2009.IV.10. (területre új)
Scolytus multistriatus (Marsham, 1802) – 2009.V.23. (területre új)
Scolytus scolytus (Fabricius, 1775) – 2009.V.23.
Xyleborus dispar (Fabricius, 1792) – 2009.IV.25., 2009.V.2.

Köszönetnyilvánítás

Köszönjük mindazok segítségét, akik a fajok azonosításában részt vettek; nevük az egyes családok neve után található. Köszönjük továbbá Sár Péter munkáját a vizsgálati anyag gyűjtésében.

Irodalom

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DOI:10.24394/NatSom.2009.15.113 | Natura Somogyiensis | 15 | 113-126 | Kaposvár, 2009

Contribution to the knowledge of the Turkish tail-wings (Neuroptera: Nemopteridae)

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Dobosz, R. & Ábrahám, L.: *Contribution to the knowledge of the Turkish tail-wings (Neuroptera: Nemopteridae).*
Abstract: In their study, the authors publish the data of nemopterid species collected in Turkey and the material preserved in both natural history museums in Poland (USMB, Bytom) and in Hungary (SCM, Kaposvár). New faunistical data are reported for 1 *Croce*, 3 *Dielocroce*, 2 *Nemoptera*, 6 *Lertha* species, earlier only 11 species in the Turkish nemopterid fauna were mentioned. *Dielocroce modesta* Hölzel, 1975, *Croce schmidti* (Navás, 1927) are new species in the fauna of Turkey. The checklist of the fauna is also given. The occurrence of the species is presented in chart by provinces and distribution maps are given for all species.

Keywords: faunistics, tail-wings, Nemopteridae, Turkey

Introduction

Due to their elongated rear wings, tail-wings (Nemopteridae) are impressive-looking insects. The number of their species in the global fauna is around 150 (Aspöck et al. 2001), thus they belong to the smaller families within the order of neuropterid insects (Neuroptera). They are found mostly in tropical, subtropical areas and in the Mediterranean region of the temperate zone.

Located in the meeting zone of Europe, Asia and the nearby Africa, Turkey is situated at the northern boundaries of the distribution area of nemopterid species. The borders of the country of Turkey are mostly natural, physical boundaries, i.e. the frontiers are marked by seas and high-altitude mountains, these terrain morphological features also delimiting distribution areas for many living organisms. Due to the extremely high diversity of natural features in these areas, the Neuroptera fauna found here is very rich (Canbulat 2007).

The first Turkish faunal data on Nemopteridae, an occurrence record of *Nemoptera sinuata* Olivier, 1811 was published in the paper by Schneider (1845). Nearly two decades later, Selys-Longchamps (1866) reported on the description of a new species, *Lertha ledereri*. Later on, around the turn of the 1900s yet another two tail-wing species (*Dielocroce ephemera* Gerstäcker, 1894, *Lertha sheppardi* Kirby, 1904) were revealed to exist in the Turkish fauna.

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

In the first half of the 20th century – maybe because of the effects of the two World Wars – only scarce data (ALEXANDROVA-MARTYNOVA 1930, ESBEN-PETERSEN 1932) arose about the country's Nemopteridae fauna, for about 70 years.

From the 1970s on, however, the exploration of the local fauna started to increase dynamically. Austrian neuropterologists, in particular, have contributed immensely to the exploration and description of Turkey's Neuroptera fauna. This is the period when the monographs describing the majority of the species in the region were produced. The taxonomic papers by HÖLZEL (1968, 1975) ASPÖCK et al. (1980, 1984) have outstanding importance in the research into the Nemopteroidae fauna. At the same time, an increasing amount of faunistic data were brought to light (POPOV 1970, GEPP 1974). The fundamentals of neuropterological research in Turkey were laid down by the comprehensive faunistical publications by SENGONCA (1974, 1981).

Later on, it was researchers from Central-European countries (Poland, Czech Republic, Hungary) who visited Turkey frequently with the aim of better exploring its fauna (eg. KACIREK 1998).

After the turn of the centuries, Turkish neuropterologists published their papers one after the other about the rich Neuroptera fauna inhabiting vast areas, reporting about the first appearance of newer and newer Nemopteridae species and about faunal surveys (ARI, KIYAK 2000, 2004, ARI et al. 2008, CANBULAT 2002, 2007, CANBULAT, KIYAK 2005, KOÇAK, KEMAL 2002, 2008; ÖZBAY et al. 2005, SATAR 2005, SATAR, ÖZBAY 2004, SATAR et al. 2004, 2007).

The main purpose of the current study is to publish faunal data from Turkey, based on specimens preserved in two Central-European museums, thus contributing to Turkey's basic fauna survey and fauna mapping.

Material and methods

On the basis of sampling possibilities, the Nemopteridae family can be grouped into two categories whose external morphological differences are quite striking. One of the groups is made up by *Nemoptera* species with coloured wings, flying in the daytime hours. The other group contains the nocturnal species with transparent wings including *Croce, Dielocroce* and *Lertha*. The species of *Croce* and *Dielocroce* fly exclusively at night, and there are only occasional specimens found during daytime hours in places where they are found in masses at nighttime. *Lertha* species, too, have nocturnal activity, but they are often found sitting on flowers, feeding on nectar at daytime, especially in the morning hours.

In accordance with all these, two different sampling methods were used for collecting Nemopteridae species, differing on the activity patterns of the different species. *Nemoptera* species were captured individually using butterfly net during the morning period before the hot noon hours and in the late afternoon after the heat has receded. For collecting nocturnal species we used transportable light-traps which were operated with light tubes of UV-rich spectra and black light type of tubes.

The collected material was deposited in two museum collections in Poland (USMB, Bytom) and Hungary (SCM, Kaposvár) respectively.

Results

The current study reveals the faunal data of Nemopteridae material collected in Turkey and deposited in a Polish (USMB Bytom) and a Hungarian (SCM Kaposvár) museum.

Turkey's Nemopteridae fauna is very rich: altogether 13 species have been found so far. The two collections preserve proof specimens of 12 species. Two species – *Croce schmidti* (Navás, 1927) and *Dielocroce modesta* Hölzel, 1975 – were described from the Turkish fauna for the fist time. We have no data about the occurrence of *Nemoptera aegyptica* Rambur, 1842 in Turkey, although it has been successfully collected in Syria, directly beside the Turkish border. The recorded species belong to two subfamilies – 4 species to Crocinae and 9 species to Nemopterinae –, and the species checklist includes all the faunistical data of the species in both collections (numbers, sex, province, settlement, date and time of collecting, collector).

Based on earlier publications about the Turkish fauna, the distribution areas of the various species by province is provided and is shown in maps (Figs 1-5).

The compilation of faunistical data is finished with the checklist of the Turkish Nemopteridae fauna.

When collecting the distribution data of the species we paid particular attention to species that were described from the area of Turkey (*Dielocroce ephemera, Lertha ledereri, Lertha vartianiae, Lertha schmidti, Lertha sheppardi*). For these species, the Turkish type localities, based on data from the original description of the species, are also specified.

List of collected species

Abbreviations:
USMB – Upper Silesian Museum, Bytom, Poland
SCM – Somogy County Museum, Kaposvár, Hungary

Croce schmidti (Navás, 1927)

MATERIAL EXAMINED:

in Coll: Upper Silesian Museum, Bytom, Poland

22♂♂, 42♀♀ - 24-25 VII 2006, Adiyaman, S of Karadut vill. 37°55'N 38°49'E, 840 m, ad lucem, leg. Roland Dobosz.

DISTRIBUTION IN TURKEY: New for Turkey.

DISTRIBUTION: It spreads from East Turkey to Pakistan in the West Palearctic region, an Irano-Eremial faunal element (ASPÖCK et al. 2001).

REMARKS: It flies in the middle of the summer, and is active at night.

Dielocroce baudii (Griffini, 1895)

MATERIAL EXAMINED:

in Coll: Upper Silesian Museum, Bytom, Poland

1♂, 2♀♀ 27-28 VII 2004 Adiyaman, Cesme Pension Nemrut Dağı N.P. 37º56'N/38º46'E, 1390 m, ad lucem leg. Roland Dobosz; 1♂, 6♀♀ 24-26 VII 2006 Adiyaman S of Karadut vill. 37º55'N/38º49'E, 840 m, ad lucem leg. Roland Dobosz.

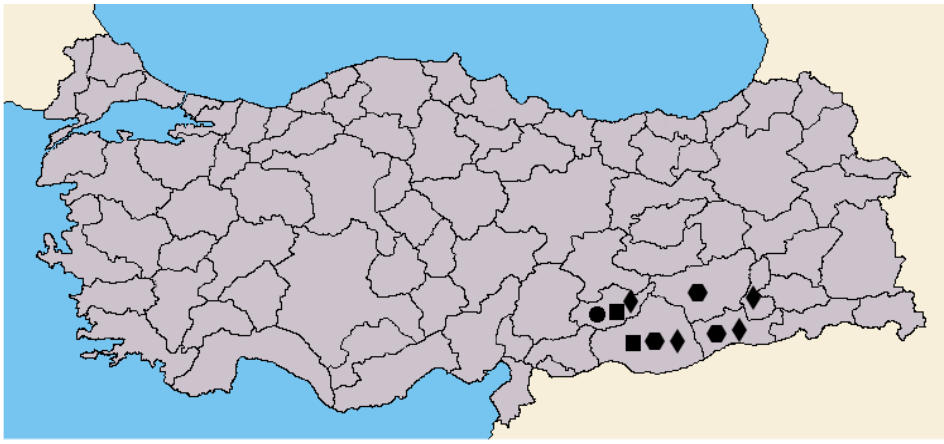

Fig. 1: Distribution of *Croce schmidti* (circle), *Dielocroce baudii* (square), *Dielocroce ephemera* (hexagonal) and *Dielocroce modesta* (deltoid) in Turkey by provinces

in Coll: Somogy County Museum, Kaposvár, Hungary
4♂♂, 10♀♀ - Şanliurfa, Halfeti, Euphrat river, 02-03 VII 1999, leg. L. Ábrahám.

DISTRIBUTION IN TURKEY: Diyarbakır, Mardin (SATAR 2005)
It is the first time for the species to occur in Adiyaman and Şanliurfa province.

DISTRIBUTION: It occurs from Turkey to Afghanistan and in Saudi-Arabia toward southern direction, unpublished data known in coll: SCM from Iran, a Syro-Eremial faunal element (ASPÖCK et al. 2001).

REMARKS: All *Dielocroce* species have nocturnal activity, and thus can be collected by light.

Dielocroce ephemera (Gerstäcker, 1894)
MATERIAL EXAMINED:
in Coll: Upper Silesian Museum, Bytom, Poland
25♂♂, 15♀♀ - Adiyaman, 18 VI 2005, N of Bosini 37°44'N 37°54'E, 748 m, 25 km E of Gabli, ad lucem, leg. Roland Dobosz.
in Coll: Somogy County Museum, Kaposvár, Hungary
1♂, 9♀♀ - Şanliurfa, 2 km N of Halfeti, 37º15'N, 37º52'E, 13 VI 1994, leg. M. Hreblay & Gy. Kovács.

DISTRIBUTION IN TURKEY: Mardin (GERSTÄCKER 1894; ŞENGONCA 1981b); Batman (SATAR & ÖZBAY 2004, SATAR CANBULAT & ÖZBAY 2004).
It is the first time for this species to occur in Adiyaman and Şanliurfa province.

DISTRIBUTION: Type locality can be found in Mardin province (SE Turkey), its occurrence in Turkey was later mentioned by (MEINANDER 1980); it is an Irano-Eremial faunal element (ASPÖCK et al. 2001).

REMARKS: This species was described from Turkey, type locality: Mardin. It is the most abundant species among the species of *Dielocroce*, active at night and collected by light.

Dielocroce modesta Hölzel, 1975

MATERIAL EXAMINED:

in Coll: Upper Silesian Museum, Bytom, Poland

5♂♂, 18♀♀ - 24-25 VII 2006, Adiyaman, S of Karadut vill. 37°55'N 38°49'E, 840 m, ad lucem, leg. Roland Dobosz.

in Coll: Somogy County Museum, Kaposvár, Hungary

3♂♂, 5♀♀ - Şanliurfa, Halfeti, Euphrat river, 02-03 VII 1994, leg. L. Ábrahám.

DISTRIBUTION IN TURKEY: It is a new species for the fauna of Turkey.

DISTRIBUTION: Known only from Oman and Iran, an Irano-Eremial faunal element (ASPÖCK et al. 2001).

REMARKS: It flies in July, collected by light.

Nemoptera coa (Linnaeus, 1758)

MATERIAL EXAMINED:

in Coll: Somogy County Museum, Kaposvár, Hungary

1♂ - Mugla, Karabögürtlen 37°03'N, 28°31'E, 17 V 2001, leg. Gy. Rozner.

DISTRIBUTION IN TURKEY: Mus (ALEXANDROVA-MARTYNOVA 1930), Bursa, İstanbul, İzmir (POPOV 1970), Adana, Bursa, Izmir, Mus (ŞENGONCA 1981).

It is the first time for this species to occur in Mugla province.

DISTRIBUTION: It is known from the Balkan Penninsula via Anatolia to the South-Caucasus; it is a policentric Ponto-Mediterranean faunal element (ASPÖCK et al. 2001).

REMARKS: It is active during the daytime.

Nemoptera aegyptiaca Rambur, 1842

MATERIAL EXAMINED: No specimen from Turkey can be found in either of the collections.

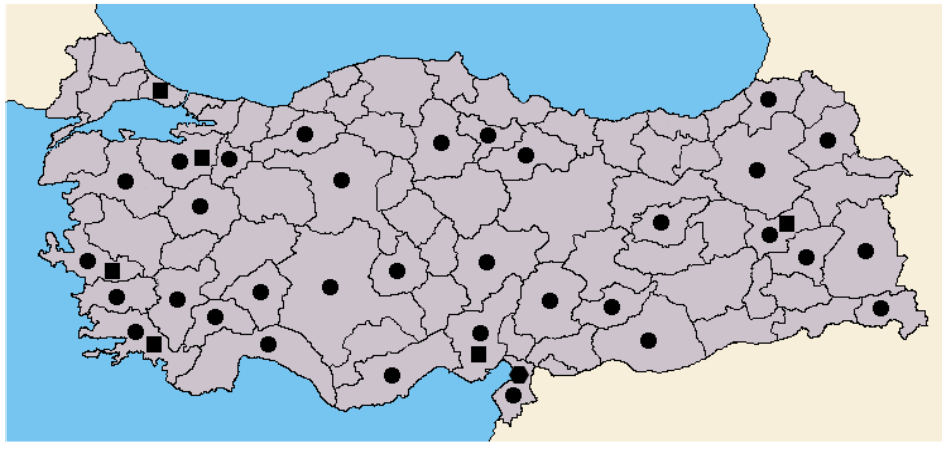

Fig. 2: Distribution of *Nemoptera coa* (square), *Nemoptera aegyptiaca* (hexagonal) and *Nemoptera sinuata* (circle) in Turkey by provinces

DISTRIBUTION IN TURKEY: Hatay (POPOV 1970, ŞENGONCA 1981)

DISTRIBUTION: It was recorded only in the eastern continental edge of the Mediterranean Sea from Egypt to Turkey; a Syrian faunal element (ASPÖCK et al. 2001).

REMARKS: In the collection of SCM there are several specimens preserved from Syria. The collecting site is adjacent to Hatay province, Turkey.

Nemoptera sinuata Olivier, 1811

MATERIAL EXAMINED:

in Coll: Upper Silesian Museum, Bytom, Poland

1♀ - 29 VII 1994, Bolu, Evikli, leg. Marek Bąkowski; 2♀♀ - 09-12 VI 2000, Mersin, Aydinlar env. 36°48'N 34°10'E, 25 km NW of Erdemli, cedar forest, leg. Roland Dobosz; Mersin, 13 VI 2000, Meşelik 37°04'N 34°46'E, leg. Roland Dobosz; 6♂♂, 2♀♀ - Adana, 14-16 VI 2000, Hasanbeyli, pass 37º09'N 36º34'E, leg. Roland Dobosz; 1♂, 2♀♀ - 20-25 V 2001, Adana, Hasanbeyli env. pass 37°07'N 36°34'E, leg. Roland Dobosz; 2♂♂ - Adana, 04 VI 2001, env. of Hasanbeyli, leg. Mark Volkovitsh; 1♂, 11♀♀ - Artvin, 15 VI 2002, 4 km NE of Aşbasan 40º46'N 41º41'E, 47 km S of Artvin, leg. Roland Dobosz; 1♂ - Tunceli, 16 VI 2002, 8 km N of Pülümür 39º30'N 39º53'E, leg. Roland Dobosz; 7♂♂, 10♀♀ - Tunceli, 17-19 VI 2002, road from Pülümür to Tunceli 39°30'N 39°55'E-39°07'N 39°32'E, leg. Roland Dobosz; 1♂, 2♀♀ - Tunceli, 18 VI 2002, 10 km NW of Tunceli 39°11'N 39°29'E, leg. Roland Dobosz; 1♂ - Erzurum, 14 VI 2004, env. of Kinaliça, 120 km N of Erzurum, leg. Roland Dobosz; 1♂, 1♀ - 16 VI 2004, Tunceli, 3 km N of Pülümür 39°32'N 39°54'E, 1700 m, leg. Roland Dobosz; 2♂♂, 6♀♀ - Mersin, 21-22 VI 2004, S of Avgadi vill., 36°41'N 34°10'E, 1000 m, 16 km N of Erdemli, oak forest, leg. Roland Dobosz; 7♀♀ - Bilecik, 16 VII 2004, N of Bozüyük 39º58'N 29º59'E, leg. Roland Dobosz; 11♂♂ - Balikeşir, 19-20 V 2005, 20 km E of Balikeşir 39º40'N 28º06'E, 100 m, leg. Roland Dobosz; 6♂♂, 3♀♀ - Adana, 5-6 VI 2005, Hasanbeyli 37º07'N 36º35'E, 985 m, leg. Roland Dobosz; 4♂♂, 6♀♀ - Adana, 07-09 VI 2005, 15 km S of Hasanbeyli 37º03'N 36º31'E, 915 m, leg. Roland Dobosz; 9♂♂ - Aksaray, 21-22 VI 2005, env. of Ihlara vill. 38º15'N 34º17'E, 1300 m, leg. Roland Dobosz; 1♂, 1♀ - Aksaray, 27 VI 2005, env. of Ihlara vill. 38º15'N 34º17'E, 1300 m, leg. Roland Dobosz.

in Coll: Somogy County Museum, Kaposvár, Hungary

3♂♂, 2♀♀ - Antalaya, 10 km E of Kas 36°13'N, 29°41'E, 21 V 2001, leg. Gy. Rozner; Antalaya, Termessos 37°01'N, 30°29'E 29 III 2007. leg: A. Márkus 1♂, 4♀♀ - Bitlis-Van, Kuskunkiran Gecidi 2350-2550m 42°46'E 38°17'N, 18-19 VII 1990, leg. Gy. László & G. Ronkay; 1♂ - Bitlis-Van, Van 38°27'N, 45°25'E, 28 VI 1993, leg. Kadlec; 1♀ - Kastanomu, Tosya 660m 41°6'N, 34°3'E, 09 VII 1996, leg. Cs. Szabóky; 2♂♂, 2♀♀ - İzmir, Pergamon 39°11'N, 27°8'E, 23 V 1989, leg. I. Rozner; 1♀ - Bitlis-Van, Kuskunkiran Gecidi 2400-2500m, 42°46'E, 38°17'N, 02 VIII 1988, leg. P. Gyulai, M. Hreblay, G. Ronkay & L. Ronkay; 8♂♂, 9♀♀ - Antalaya, Yeniköy 36°13'N, 29°36'E, 12 VI 1994, leg. K. Gaskó; 1♂, 3♀♀ - Mardin, vill. cel. Orta Toroslar, Hop Gecidi 300m, 11 VI 2004, leg. I. Nádai; 11♂♂, 2♀♀ - Hakkari, 35 km E of Hakkári 1600m 37°36'N, 43°45'E, 14 VI 2004, leg. B. Benedek & T. Csővári; 1♀ - Adiyaman, Nemrad Dagi 37°54'N, 38°36'E, ? VII 2000, leg. V. Gurko; 1♂ - Adiyaman, Nemrad Dagi 37°54'N, 38°36'E, VII 2000, leg. Werner & Lizler; 1♀ - Kayseri, 10 km E of Kas 38°27'N, 43°25'E 21 V 2001, leg. Gy. Rozner; 1♂ - Turkey, ?, 22 VI 1994, leg. Šlactha.

DISTRIBUTION IN TURKEY: Antalya (SCHNEIDER 1845), Turkey (KIRBY 1900), Artvin, Kars, Mus, (ALEXANDROVA-MARTYNOVA 1930), Konya (ESBEN-PETERSEN 1932); Hakkari (GEPP 1974); Amasya, Antalya, Isparta, Mersin, Kahramanmaraş Konya (HÖLZEL 1968); Hakkari, İzmir, Kütahya (ŞENGONCA 1979), Adana, Ankara, Antalya, Bitlis, Bursa, Çorum, Isparta, Izmir, Hatay, Kahramanmaraş, Mersin, Mugla, Mus, Konya, Kars, Şanlıurfa, Tokat (ŞENGONCA 1981), Adana, Mersin (KACIREK 1998); Adana (ARI & KIYAK 2000); Kayseri (CANBULAT 2002); Şanlıurfa (SATAR & ÖZBAY 2004); Antalya, Aydın, Burdur, Denizli, Isparta, Muğla (CANBULAT & KIYAK 2005).

It is the first time for this species to occur in the provinces of Adiyaman, Aksaray, Balikeşir, Bilecik, Bolu, Erzurum, Kastanomu, Tunceli.

DISTRIBUTION: It spreads from the Balkan Peninsula via Anatolia and South Caucasus (KOZLOV 1985) to Alborz Mountains, it is a policentric Ponto-Mediterranean faunal element (ASPÖCK et al. 2001).

REMARKS: It flies in late spring and in early summer, and has abundant populations locally.

Lertha ledereri (Selys-Longchamps, 1866)

MATERIAL EXAMINED:

in Coll: Upper Silesian Museum, Bytom, Poland

2♂♂ - Nevşehir, 24 VI 2004, 2 km NW of Avanos 38º44'N 34º48'E, 940 m, leg. Roland Dobosz; 33♂♂, 16♀♀ - Aksaray, 21-22 VI 2005, env. of Ihlara vill. 38º15'N 34º17'E, 1300 m, leg. Roland Dobosz; 4♀♀ - Nevşehir, 24 VI 2005, 2 km NW of Avanos 38°44'N 34°48'E, 940 m, leg. Roland Dobosz; 1♂, 1♀ - Nevşehir, 25 VI 2005, env. of Ortahisar 38°38'N 34°52'E, 1210 m, leg. Roland Dobosz; 2♀♀ - Nevşehir, 25-26 VI 2005, 5 km S of Ügrüp 38°36'N 34°54'E, 1080 m, leg. Roland Dobosz; 1♀ - Nevşehir, 26-27 VI 2005, Nargölu 38°201'N 34°27'E, 1400 m, 26 km W of Derinkuyu, leg. Roland Dobosz; 8♂♂, 3♀♀ - Aksaray, 27 VI 2005, env. of Ihlara vill. 38º15'N 34º17'E, 1300 m, leg. Roland Dobosz.

in Coll: Somogy County Museum, Kaposvár, Hungary

1♂,1♀ - Ankara, Tuz Gölü 39º01'N, 33º29'E, near Sereflikochisar, 20-21 VI 1992, leg. P. Gyulai; 3♀♀ - Ankara, Tuz Gölü 39º01'N, 33º29'E, 20 km NW of Sereflikochisar, 01 VII 1994, leg. L. Ábrahám; 1♀ - Şanliurfa, 2 km N of Halfeti 37º15'N, 37º52'E, 400 m, 13 VI 1994, leg. M. Hreblay & Gy. Kovács.

DISTRIBUTION IN TURKEY: Konya, Kayseri, (HÖLZEL 1968); İzmir, Kayseri (POPOV 1970); Konya (ESBEN-PETERSEN 1933); Denizli (ASPÖCK et al. 1980); Izmir, Kayseri, Konya (SENGONCA 1981); Konya (ASPÖCK et al. 1984); Niğde (KACIREK 1998); Kayseri (CANBULAT 2002); Antalya, Burdur, Isparta, Denizli (CANBULAT & KIYAK 2005b).

It is the time for this species to occur in Aksaray, Ankara, Nevşehir and Şanliurfa provinces.

DISTRIBUTION: Type material from Turkey, Konya: Ova village (in coll.: Selys, ESBEN-PETERSEN 1933), later it was mentioned from Turkey by KIRBY (1900).

Known from Greece (Kos), Turkey, South Caucasus (KOZLOV 1985) and unpublished data from Iran in coll. SCM, an Eremial faunal element (ASPÖCK et al. 2001).

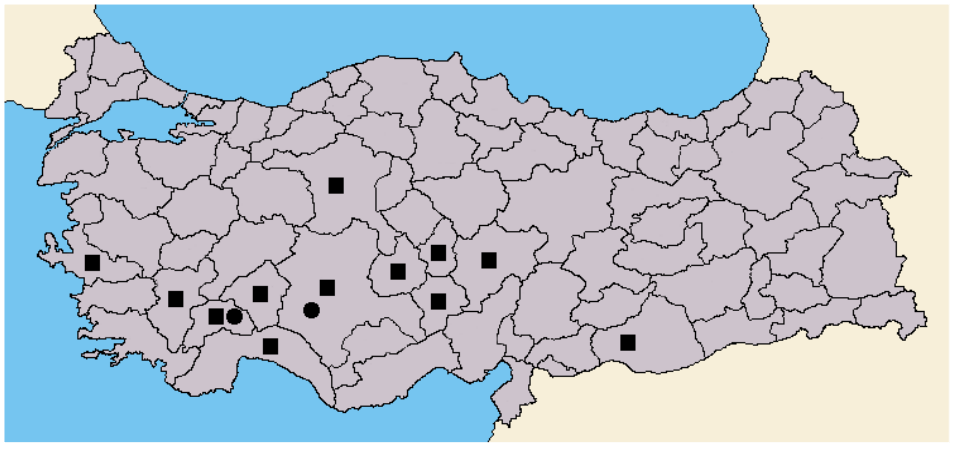

Fig. 3: Distribution of *Lertha ledereri* (square) and *Lertha vartianae* (circle) in Turkey by provinces

REMARKS: It flies in June and July, and is active at night and daytime as well.

Lertha vartianae Aspöck H., Aspöck U. & H. Hölzel, 1984

MATERIAL EXAMINED:

in Coll: Somogy County Museum, Kaposvár, Hungary

2♂♂ - Burdur, Dagi Ermenek 36º 37'N, 32º 55'E, 06 VII 1998, leg. A. Möberg.

DISTRIBUTION IN TURKEY: Konya (ASPÖCK et al. 1984).

It is the first time for this species to occur in Burdur.

DISTRIBUTION: Hitherto, it has been collected only in Turkey; an Eremial faunal element (ASPÖCK et al. 2001).

REMARKS: The type localities are Ereğli and Ereköy in Konya province. After its description it was not recorded from any other place in Turkey. It seems to be a real endemic species surrounding the Taurus Mountains.

Lertha extensa (Olivier, 1811)

MATERIAL EXAMINED:

in Coll: Upper Silesian Museum, Bytom, Poland

18♂♂, 25♀♀ - Şanliurfa, 04 VI 2002, 24 km W of Viranşehir 37º17'N 39º30'E, leg. Roland Dobosz & Jerzy Szypuła; 4♂♂, 1♀ - Mardin, 04-05 VI 2002, Hop Geçidi 37°21'N 40°51'E, 1115 m, 8 km N of Mardin, leg. Roland Dobosz; 1♂ - Adiyaman, 28 VII 2004, road to the top of Nemrut Dağı 37º58'N/38º44'E, 1897 m, Nemrut Dağı N.P., Roland Dobosz; 2♂♂, 2♀♀ - Diyarbakir, 02 VI 2005, S of Diyarbakir 37°39'N 40°28'E, 705 m, leg. Roland Dobosz; 4♂♂, 2♀♀ - Mardin, 03 VI 2002, E of Hop Geçidi 37°22'N 40°52'E, 905 m, 10 km E of Mardin, leg. Roland Dobosz; 3♂♂, 5♀♀ - Gaziantep, 04 VI 2005, 10 km W of Birecik 37°00'N 37°50'E, 477 m, leg. Roland Dobosz.

DISTRIBUTION IN TURKEY: Agri (Ararat) ALEXANDROV-MARTYNOV 1930; Malatya (HÖLZEL 1968); Hatay (TJEDER 1970); Şanlıurfa, Hakkari (ŞENGONCA 1979); Hakkari, Hatay, Kahramanmaraş, Malatya, Urfa (ŞENGONCA 1981); Kahramanmaraş, Şanlıurfa (KACIREK 1998); Van (KOÇAK & KEMAL 2002); Diyarbakır, Mardin, Siirt (SATAR & ÖZBAY 2004); Iğdır, Kars (ARI 2004); Elaziğ (ÖZBAY et al. 2005); Batman, Bitlis Şirnak (KOÇAK & KEMAL 2008).

It is the first time for this species to occur in Adiyaman and Gaziantep provinces.

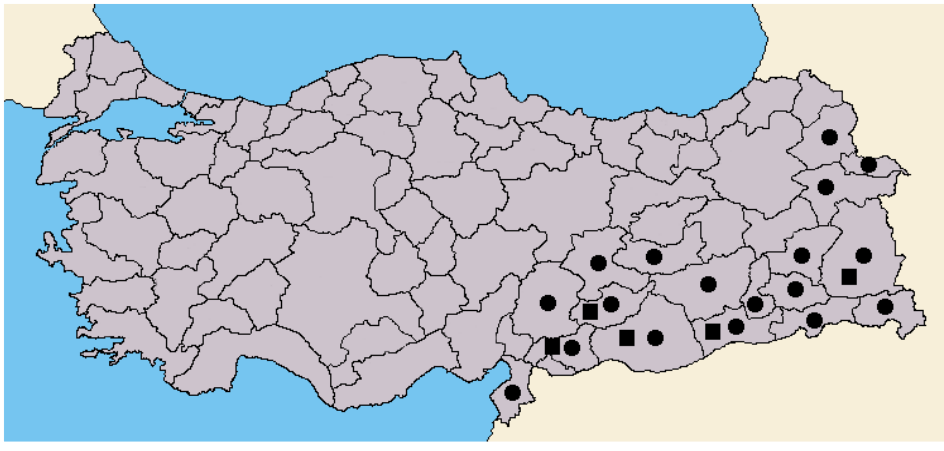

Fig. 4: Distribution of *Lertha extensa* (circle) and *Lertha palmonii* (square) in Turkey by provinces

DISTRIBUTION: Turkey, Iran, Iraq, Jordan; an Irano-Eremial faunal element (ASPÖCK et al. 2001).

REMARKS: The type locality (Mardin) of the species can be found in Turkey. It flies in June and July, and is active at night, collected by lamp.

Lertha palmonii (Tjeder, 1970)

MATERIAL EXAMINED:

in Coll: Upper Silesian Museum, Bytom, Poland

3♂♂, 1♀ - Şanliurfa, 04 VI 2002, 24 km W of Viranşehir 37º17'N 39º30'E, leg. Roland Dobosz; 1♂, 1♀ - Mardin, 04-05 VI 2002, Hop Geçidi 37°21'N 40°51'E, 1115 m, 8 km N of Mardin, leg. Roland Dobosz; 1♂ - Adiyaman, 28 VII 2004, road to the top of Nemrut Dağı 37º58'N/38º44'E, 1897 m, Nemrut Dağı N.P., Roland Dobosz; 1♂, 1♀ - Mardin, 10 km E of Mardin, 37º20'N 40º46'E, 905 m, leg. Roland Dobosz; 5♂♂, 3♀♀ - Gaziantep, 04 VI 2005, 10 km W of Birecik 37°00'N 37°50'E, 477 m, leg. Roland Dobosz.

in Coll: Somogy County Museum, Kaposvár, Hungary

1♂, 3♀♀ - Şanliurfa, Halfeti valley of Euphrat 37°55'E, 37°15'N, 500m, 24 V 1990, leg. Cs. Szabóky.

DISTRIBUTION IN TURKEY: Van (KOÇAK & KEMAL 2002); Mardin (KOÇAK & KEMAL 2008)

DISTRIBUTION: Israel (TJEDER 1970, ASPÖCK et al. 2001), new to Iran and Armenia (coll. SCM)

REMARKS: This species is most probably more widespread in the eastern parts of Turkey, as is revealed by our new data. This species was described only 40 years ago, and is not treated by all of the authors as a separate taxon (ASPÖCK et al. 1984, 2001). KOÇAK & KEMAL (2002, 2008) and ARI et al. (2008) mention this species as *L. extensa* although the species in the published photographs is clearly *L. palmonii*. It flies from the end of May to August.

Lertha schmidti (H. Aspöck & U. Aspöck Hölzel, 1984)

MATERIAL EXAMINED:

in Coll: Upper Silesian Museum, Bytom, Poland

1♂ - Ankara, 20 VI 2004, 15 km N of Karahamzalı 39º20'N 32º55'E, 1075 m, leg. Roland Dobosz; 1♂, 6♀♀ - Nevşehir, 25 VI 2004, Kirşehir 39º20'N 34º02'E, 1180 m, leg. Roland Dobosz.

DISTRIBUTION IN TURKEY: Konya (ASPÖCK et al. 1984); Şanlıurfa, Diyarbakır (SATAR & ÖZBAY 2004), Antalya (CANBULAT & KIYAK 2005).

It is the first time to occur in Ankara and Nevşehir provinces.

DISTRIBUTION: Known only in Turkey, an Eremial faunal element (ASPÖCK et al. 2001).

REMARKS: Type localities Ekisehir and Konya can be located in Central Anatolia. It is also an endemic species for Inner Anatolia. It flies in June.

Lertha sheppardi (Kirby, 1904)

MATERIAL EXAMINED:

in Coll: Upper Silesian Museum, Bytom, Poland

1♂,1♀ - Şanliurfa, 4 VI 2002, 24 km W of Viranşehir 37º17'N 39º30'E, leg. Roland Dobosz; 1♂ - Diyarbakir, 02 VI 2005, S of Diyarbakir 37°39'N 40°28'E, 705 m, leg. Roland Dobosz.

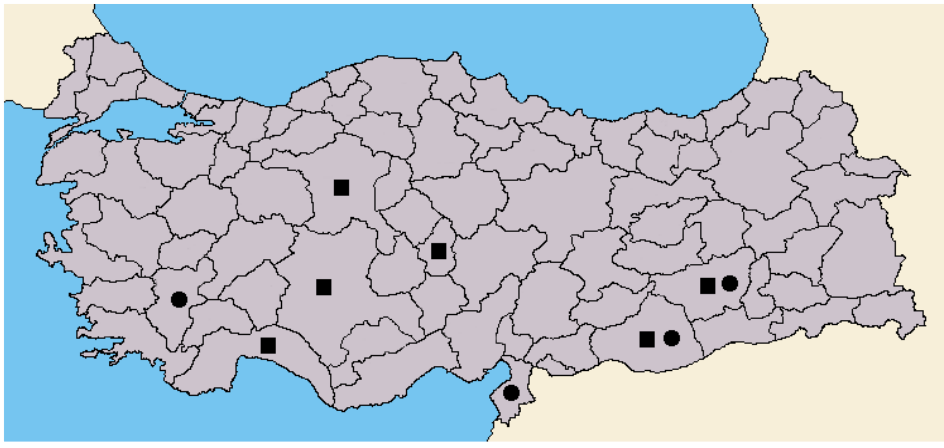

Fig. 5: Distribution of *Lertha schmidti* (square) and *Lertha sheppardi* (circle) in Turkey by provinces

DISTRIBUTION IN TURKEY: Hatay (NAVÁS 1912; HÖLZEL 1968); Denizli (ŞENGONCA 1979); Denizli, İçel (ŞENGONCA 1981); Diyarbakır, Şanlıurfa (SATAR & ÖZBAY 2004).

DISTRIBUTION: Only in Turkey, an Eremial faunal element (ASPÖCK et al. 2001).

REMARKS: Type locality in Amanus Mountains (Hatay province SE Turkey), it flies in June.

Checklist of the Turkish tail-wing species

Nemopteridae Burmeister, 1839
Crocinae Navás, 1910
1. Croce schmidti (Navás, 1927)
2. Dielocroce baudii (Griffini, 1895)
3. Dielocroce ephemera (Gerstäcker, 1894)
4. Dielocroce modesta Hölzel, 1975

Nemopterinae Burmeister, 1839
5. Nemoptera coa (Linnaeus, 1758)
6. Nemoptera aegyptiaca Rambur, 1842
7. Nemoptera sinuata Olivier, 1811
8. Lertha ledereri (Selys-Longchamps, 1866)
9. Lertha vartianae Aspöck H., Aspöck U. & H. Hölzel, 1984
10. Lertha extensa (Olivier, 1811)
11. Lertha palmonii (Tjeder, 1970)
12. Lertha schmidti (H. Aspöck & U. Aspöck Hölzel, 1984)
13. Lertha sheppardi (Kirby, 1904)

Table 1: Distribution of the Turkish tail-wing species in provinces (+ - new data, # - bibliogaphy data)

	1	2	3	4	5	6	7	8	9	10	11	12	13
Adana					#		+#						
Adıyaman	+	+	+	+			+			+	+		
Ağrı										#			
Aksaray							+	+					
Amasya							#						
Ankara							#	+				+	
Antalya							+#	#				#	
Artvin							+#						
Aydın							#						
Balıkesir							+						
Batman			#							#			
Bilecik							+						
Bitlis							+#			#	#		
Bolu													
Burdur							#	#	+				
Bursa					#		#						
Çorum							#						
Denizli							#	#				#	+#
Diyarbakır										#			#
Elazığ										#			
Erzurum							+						
Gaziantep										+	+		
Hakkari							+#			#			
Hatay						#	#			#			#
İçel							+#						
Iğdır										#			
Isparta							#	#					
İstanbul					#								
İzmir					#		+#	#					
Kahramanmaraş							#			#			
Kars							#			#			
Kastamonu							+						
Kayseri							+#	#					
Konya							#	#	#			#	
Kütahya							#						
Malatya										#			
Manisa													
Mardin		#	#							+#	+#		
Muğla					+		#						
Muş					#		#						
Nevşehir								+				+	
Niğde								#					
Şanlıurfa		+	+	+			#	+		+#	+	#	+#
Siirt										#			
Şırnak										#			
Tokat							#						
Tunceli							+						

Remarks: Number in columns refers to the number of species in the checklist.

Discussion

Turkey's Nemopteridae fauna, in comparison with that of Europe (ASPÖCK et al. 2001), is extremely rich. The Nemopteridae fauna of Asia Minor includes several endemic species belonging to *Lertha* genus (*L. vartianiae, L. schmidti, L. sheppardi*).

For several of the species (eg. *L. ledereri, N. aegyptica*) it is here that they reach the northernmost or westernmost limits of their distribution range. Among the Nemopteridae species listed hereby there were 2 species that were found in the fauna of the country for the first time, which allows the conclusion that other species might also be found (*Lertha, Dielocroce*) in the future, because the eastern parts of Turkey is open towards the Asian areas, despite the presence of high mountains.

Most likely it is the Turkish Neuroptera fauna researchers, having achieved significant results since the turn of the centuries, who will clarify the distribution of species in this country which is huge even when compared with European states, and has an extremely diverse complex of natural features.

The views of researchers in respect of the separateness of *Lertha extensa* and *L. palmonii* are not uniform (TJEDER 1970, ASPÖCK et al 1984, 2001), therefore more exact faunistic data need to be produced, and the distribution maps should be revised.

From a nature conservation aspect, special attention should be paid to those endemic members of the Nemopteridae fauna (*Lertha vartianiae, L. schmidti, L. sheppardi*) which populate the Anatolian plateau and the southern areas near the Mediterranean Sea.

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DOI:10.24394/NatSom.2009.15.127 | Natura Somogyiensis | 15 | 127-158 | Kaposvár, 2009

Sawflies of the Zselic Hills, SW Hungary (Hymenoptera: Symphyta)

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Haris, A.: *Sawflies of the Zselic Hills, SW Hungary (Hymenoptera: Symphyta)*.
Abstract: The first paper on sawflies of Zselicség (Hungary, South-West Transdanubia) is presented. 192 sawfly species are recorded. *Paracharactus* (*Dicrostema*) *gracilicornis* (Zaddach, 1859) is a new record for the Hungarian sawfly fauna.

Keywords: Hymenoptera, Symphyta, Zselic Hills, Hungary

Introduction

Zselicség (or Zselic Hills) is a landscape area in Southern Transdanubia (Hungary) extending North to the valley of River Kapos, South to Szigetvár and Mecsek Hills, East to Dombóvár and West to Lad. It is situated mainly in Somogy and Baranya counties, with an area also in Tolna County, rich in cultural and natural values (Figs 1, 2, 3, 4 and 5). The Zselicség is a hilly area (Fig. 4), its highest point being 357 m (Hollófészek). The lower regions are situated between100-103 meters above sea level and the average height of the hills varies between 200-250 m. These surface formations are derived from the Pannon sediment. About 10 million years ago, this area was covered by the early Pliocene Pannon See. Its sediments (clay, sand and marl) are about 1000m thick at Kaposvár and reach even 2500m at South Zselic. On the sediments of the Pannonian See (Pannonian Plate), the surface formations were created by erosion and watercourses. Later, during the glacial periods, loess covered the Pannonian plates. The hills of Zselic form a watershed in East-West direction through the region. The water of the northern brooks (the largest is the Surján brook) is collected by the River Kapos and the southern by the River Dráva (like Brook Almás). In total, 31 smaller and larger brooks cross the land. These brooks are frequently dammed, creating small artificial ponds (mainly fishing ponds) like Vörösalma (Fig. 3), Petörke, Ropoly, Bánya, Szentbalázs and Gálosfa Ponds that enhances the aesthetic appeal of the landscape. The most important watercourses are: Brook Bárdi (length: 15 km, catchment area: 66.5 km^2), Brook Berki (15 km, 67 km^2), Brook Zselic (10.6 km, 21 km^2), Brook Surján (20.5 km, 113 km^2) belonging to the catchment area of River Kapos, with Brook Almás (221 km^2, 39.5 km) and Brook Gyöngyös (152 km^2, ill. 28 km) belonging to that of River Dráva.

The total area is approximately 103 000 acres. 9 046 acres is landscape protected area, most of which is forest; partly oak forests (*Quercus cerris* and *Quercus petrea*) with lime trees (*Tilia tomentosa*) and partly beech forests (*Fagus sylvatica*) mixed with hornbeam

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

(*Carpinus betulus*). Scots Pine (*Pinus sylvestris*) is native there but plantations of other conifer species are also widespread. A local curiosity is the Millenium Linden Forest established in 1896.

Climate is continental, influenced by Mediterranean effects. Winters are mild and summers hot. The yearly sunshine hours are between 1950-2500, increasing from West to East. Annual average precipitation about 700-750 mm and yearly mean temperature 9.8 – 10.7 ºC.

First traces of human settlements date back to the 5th millennium BC. (Neolithic settlements at Szalacska and Visnye). Remains from Lipótfa, Kisasszond and the treasure of Simonfa are dated back to the Bronze Age. Hedrehely was a Celtic settlement once (after the 4th century BC). Although Pannonia was conquered by Romans after 35 AD, there hardly any traces of Romans in this area Roman fortress of Kaposszentjakab (coins, bronze statuettes). The first mention of Zselic is found in the donation certificate of Hungarian king László the 1st dated to 1093. In the 13th century 10 villages are recorded from the area, like Márcadó, Szerénke, Dercze, Vállusfej, Szerentelke, Nyírakol, Szentlászló, Bőszénfa and Karan. All of them were the property of the Saint Jacob Abbey in Kaposszentjakab. After 1220, the Pannonhalma Abbey settled Slavonic lumberjkacks to the Zselicség (the name of Kistótváros preserves their memories). Until the Turkish occupation the population was dominantly Hungarian. After the Turkish period, 90 of the original 130 villages were destroyed. The landowners replaced the mostly extinct Hungarian population with German settlers. Up to the 15th century, the members of the Győr dynasty were the lords of the Zselicség. Later, the land was passed to Lady Orsolya Derssfy. After her marriage to Prince Miklós Esterházy, the Esterházy dynasty became the major landowner. In our days, the most valuable territories including the protected area belong to Somogyi Forest Management and Timber Processing Company.

Although, the botanical investigation of the Zselicség was commenced by Pál Kitaibel in 1799, intensive zoological research started only comparatively recently, in the late 70's of the 20th century. Zoological investigation was started by amateur lepidopterologists from Kaposvár, namely by Sándor Pazsiczky and Miklós Nattán in the first half of the 20th century. Unfortunately, they did not publish their captures. The first zoological paper on the Zselicség (POLINSZKY 1886) was published by Emil Polinszky in 1886 on the beetle fauna of Somogy County, mainly around Szigetvár (in that time Szigetvár belonged to Somogy County). Unfortunately no one followed his publication activity. In the early 1980's, Ákos Uherkovich initiated the Zselic research. Because of a lack of money, he never published his planned monograph, therefore the manuscripts which had already been prepared were published in various local periodicals. Till now, 5 insect groups have been elaborated. Macrolepidoptera are represented by 889 species (ÁBRAHÁM 1989, 1992, ÁBRAHÁM and UHERKOVICH 1993, SZABÓ 2007, UHERKOVICH 1978, 1980, 1981, 1982a, b, UHERKOVICH and ÁBRAHÁM 2007), Aculeata (Hymenoptera) by 698 species (JÓZAN 1990, 1992, 2006), Syrphidae (Diptera) by 110 species (TÓTH 1992), Carabidae (Coleoptera) by 122 species (HORVATOVICH 1990), and Trichoptera by 84 species (NÓGRÁDI and UHERKOVICH 1990). Between 2006 and 2008, 3 biodiversity days (3 terms of 3 days in spring, summer and autumn seasons) were held in Gyűrűfű, Southern Zselic (Baranya county). The results these biodiversity days have been published in a separate monograph (ÁBRAHÁM 2009). Zoological results of Zselic researches are also included in the monograph titled "Catalogue of the fauna of Somogy County" (ÁBRAHÁM 2001). On the sawflies of Zselicség we have only sporadic data: firstly Haris published on the sawfly collection of the Somogy county museum and also the list of sawflies of Somogy county including numerous records from this region (HARIS 1998,

2001b), later he published a revised list of the Hungarian Nematinae including several places of capture from the Zselic Hills (HARIS 2001a) and finally Roller and Haris listed several new records of sawflies in their book, including also an elaboration of the already published data (ROLLER and HARIS 2008).

Material and methods

The first phase of collection by the author started in 1990 and lasted until 1992. These collections were restricted to Kaposmérő (Northern border of Zselic) and resulted in records of approximately 125 species. Seventeen years after, I was able to continue the investigation in other territories of the region. This year, I investigated the sawfly fauna of the Northern Zselic (Somogy part). This is the part where the Zselic Landscape Protected Area is situated, which is considered to support greatest biodiversity in the region.

For identification Zhelochovtsev's work on the sawflies of the European part of the former USSR (ZHELOCHOVTSEV 1988) was consulted, together with the Fauna Hungariae series (MÓCZÁR and ZOMBORI 1973, ZOMBORI 1982, 1990a). We also used some recent revisions to make the identification even more precise (BLANK and RITZAU 1998, HARIS 2006, HEIDEMAA et al., 2004, HEIDEMAA and VITASAARI 2004, KOCH 1988).

For the discussion of the distribution of sawflies, we consulted the book of Roller and Haris titled Sawflies of the Carpathian Basin, History and Current Research (ROLLER and HARIS 2008) and also the Compendium of Liston (LISTON 1995). The higher classification of sawflies applied follows the Hymenoptera part of Fauna Europaea (ACHTERBERG 2004). Our references for biological data of sawflies are SCHEDL 1991, KRAUS 1998, PSCHORN-WALCHER and ALTENHOFER 2000, 2006, CHEVIN 1985 and LISTON 1995, 1997, 2004.

The collected insects are deposited in the entomological collection of the Somogy County Museum, Kaposvár, Hungary.

List of localities and dates of capture

1. Zselickisfalud. Enyezd barracks. Pasture, South of the barracks, alongside the brook. 03. 04. 2009, 10. 04. 2009 and 08. 05. 2009. Between 46º 12' 24.12" N, 17° 45' 50.21" E and 46º 12' 33.31" N, 17° 45' 56.71" E.

2. Kaposszentbenedek. Meadows close to Petörke Lake and the Cloister including the hill behind the Saint Benedict monument. 05. 04. 2009, 10. 04. 2009, 19. 04. 2009, 26. 04. 2009, 10. 05. 2009, 12. 07. 2009, 19. 07. 2009 and 09. 08. 2009. Between 46º 19' 39.68" N, 17° 41' 58.11" E and 46º 20' 09.37" N, 17° 41' 59.84" E.

3. Bárdudvarnok: Lipótfa: Cseberki forest. Immediately after leaving the Kadarkút road towards Lipótfa. 05. 04. 2009. Around 46° 18' 00.33" N, 17° 39' 10.36" E.

4. Bárdudvarnok: Lipótfa. Immediately after leaving the Kadarkút road towards Lipótfa. 16. 05. 2009and 26. 04. 2009. Around 46º 17' 56.28" N, 17° 39' 10.94" E.

5. Zselicszentpál: Drinking-water plant. Marshy meadow. 10. 04. 2009, 11. 04. 2009, 18. 04. 2009, 24. 04. 2009, 03. 05. 2009, 09. 05. 2009 and 16. 05. 2009. Between 46º 18' 19.10" N, 17° 49' 08.91" E and 46º 18' 12.70" N, 17° 49' 14.61" E.

6. Bőszénfa: Ropoly: Fish pond. 11. 04. 2009, 18. 04. 2009, 24. 04. 2009, 01. 05. 2009 and 08. 05. 2009. Around 46º 14' 39.30" N, 17° 46' 33.03" E

7. Zselickisfalud: ferns in forest towards Ropoly, 2.0 km from road 67. 18. 04. 2009, 24. 04. 2009, 01. 05. 2009, 12. 07. 2009 and 18. 07. 2009. Between 46º 15' 22.12" N, 17° 48' 23.41" E and 46º 15' 25.50" N, 17° 48' 19.36" E.

8. Simonfa: Tótyai dűlő. Meadow 700 m from road 67. 24. 04. 2009, 03. 05. 2009 and 25. 04. 2009.

Between 46º 16' 08.23" N, 17° 49' 52.09" E and 46º 16' 03.22" N, 17° 49' 54.52" E.

9. Zselickislak: meadow near the roundabout at the end of the village. 25. 04. 2009, 01. 05. 2009, 08. 05. 2009, 15. 05. 2009, 23. 05. 2009, 30. 05. 2009, 06. 06. 2009, 20. 06. 2009, 12. 07. 2009 and 09. 08. 2009. Between 46° 18' 37.34' N, 17° 47' 45.65" E and 46° 18' 46.34' N, 17° 47' 45.62" E.

10. Simonfa: Fir forest. 1.9 km from road 67. 25. 04. 2009, 03. 05. 2009, 08. 05. 2009, 09. 05. 2009 and 09. 08. 2009. Between 46º 16' 11.80" N, 17° 50' 33.31" E and 46º 16' 21.13" N, 17° 50' 30.77" E.

11. Kaposgyarmat: right from the roundabout situated at the end of village, 1 km long. 01. 05. 2009, 15. 05. 2009 and 18. 07. 2009. Between 46º 16' 52.35" N, 17º 52' 35.97" E and 46º 17' 11.80" N, 17º 52' 31.89" E.

12. Szenna. Meadow at the end of the village towards Kaposvár, opposite the paintball field. 24. 05. 2009, 12. 07. 2009, 15. 08. 2009, 12. 04. 2009 and 04. 04. 2009. Between 46º 18' 38.08" N, 17° 44' 29.25" E and 46º 18' 35.83" N, 17° 44' 34.23" E.

13. Szenna: Denna meadow at Dennai forest (Fig. 5), South of Bánya and Lipótfa. 2009 04. 04., 10. 04. 2009, 26. 04. 2009, 16. 05. 2009, 24. 05. 2009, 30. 05. 2009, 20. 06. 2009 and 15. 08. 2009. Between 46º 15' 20.03" N, 17° 41' 15.40" E and 46º 15' 23.18" N, 17° 41' 05.54" E.

14. Sántos. Páprágypuszta South of the ruins. 23. 05. 2009, 06. 06. 2009 and 10. 08. 2009. Between 46º 21' 10.46" N, 17º 53' 16.57" E and 46º 21' 04.00" N, 17º 53' 40.92" E.

15. Kaposmérő, in 1990-1992. Mainly between 46º 21' 58.19" N, 17° 42' 27.61" E and 46º 21' 58.61" N, 17° 42' 38.08" E furthermore between 46º 21' 11.69" N, 17° 42' 35.68" E and 46º 21' 50.08" N, 17° 42' 38.53" E and 46º 21' 40.63" N, 17° 43' 24.22" E.

16. Szenna: at Denna forester's lodge at 03. 04. 2009. Around 46º 14' 16.96" N, 17º 42' 11.77" E. Close to Lipótfa.

17. Zselickisfalud. Meadow at Keleti Gyöngyös brook (2 km East of Enyezd barracks towards Lipótfa where forestry road crosses the brook), 03. 04. 2009. Between 46º 12' 09.38" N, 17° 45' 35.16" E and 46º 12' 05.38" N, 17° 45' 33.06" E.

18. Zselickisfalud: alongside the road, agricultural fields towards Kardosfa. 04. 04. 2009. Between 46º 16' 29.48" N, 17° 45' 14.66" E and 46º 16' 40.028" N, 17° 45' 13.20" E.

19. Bánya: lake. 2009 04. 05. Between 46º 16' 23.22" N, 17° 40' 09.74" E and 46º 16' 11.70" N, 17° 40' 05.39" E.

20. Kaposgyarmat: Old railway. Pasture and forest. 10. 04. 2009 Between 46º 16' 394.98" N, 17° 53' 46.70" E and 46º 16' 45.54" N, 17° 53' 50.21" E.

21. Bőszénfa: Ropoly. Clearing in forest. 11. 04. 2009 Around 46º 15' 16.15" N, 17° 47' 02.89" E.

22. Zselickisfalud: marshy meadow, immediately after the village, close to Szilvásszentmárton. 11. 04. 2009 and 18. 04. 2009.Between 46º 16' 21.92" N, 17° 43' 46.31" E and 46º 16' 31.37" N, 17° 43' 52.68" E.

23. Kaposszerdahely: marshy meadow, inner area of the village, towards Kaposvár. 12. 04.2009. Between 46º 19' 47.41" N, 17° 45' 28.84" E and 46º 19' 55.53" N, 17° 45' 30.90" E.

24. Gálosfa: meadow, inner area of the village towards Szentbalázs. 12. 04. 2009 and 2009 04. 24.Between 46º 14' 53.42" N, 17° 53' 32.31" E and 46º 14' 49.03" N, 17° 53' 34.05" E.

25. Zselickisfalud: Ropoly forestry road, forest, about 2 km from road 67. Around 46º 15' 27.92" N, 17° 48' 36.10" E

26. Bőszénfa: Ropoly: meadow. Opposite the buildings. 18. 04. 2009, 09. 08. 2009 and 15. 08. 2009. Between 46º 15' 10.64" N, 17° 46' 46.47" E and 46º 15' 06.52" N, 17° 46' 44.90" E.

27. Cserénfa: Irafai forest. 2.4 km from road 66. 24. 04. 2009 Between 46º 17' 19.46" N, 17° 51' 21.12" E and 46º 17' 24.18" N, 17° 51' 19.39" E.

28. Cserénfa: Könyökes, alongside the forestry road. 4.2 km from road 66. 24. 04. 2009. Between 46º 16' 34.48" N, 17° 50' 49.66" E and 46º 16' 35.48" N, 17° 50' 46.08" E.

29. Cserénfa: Fürteleki forest. 25. 04. 2009. Between 46º 19' 42.32" N, 17° 52' 00.77" E and 46º 19' 40.66" N, 17° 51' 56.11" E.

30. Cserénfa: Irafai forest. Alongside the forestry road, 3 km from road 67. 12. 04. 2009. Between 46º 16' 12.79" N, 17° 50' 38.37" E and 46º 16' 15.52" N, 17° 50' 36.17" E.

31. Szentbalázs: Herceg-képe, top of the hill (Fig. 4), sweeping in the forest clearing, 2.7 km from the road to Pécs. 25. 04. 2009. Around 46° 18' 04.65" N, 17° 54" 12.08".

32. Szentbalázs: Nagy-Bicó: Forestry (Sefag) road, 800-1500 m North of the road to Pécs: forest and clearing. 03. 05. 2009. Between 46º 18' 56.80" N, 17° 56' 07.43" E and 46º 19' 49.70" N, 17° 54' 09.24" E.

33. Szentbalázs: Herceg-képe. Alongside the forestry road. 15. 05. 2009. Between 46º 18' 46.47" N, 17° 54'

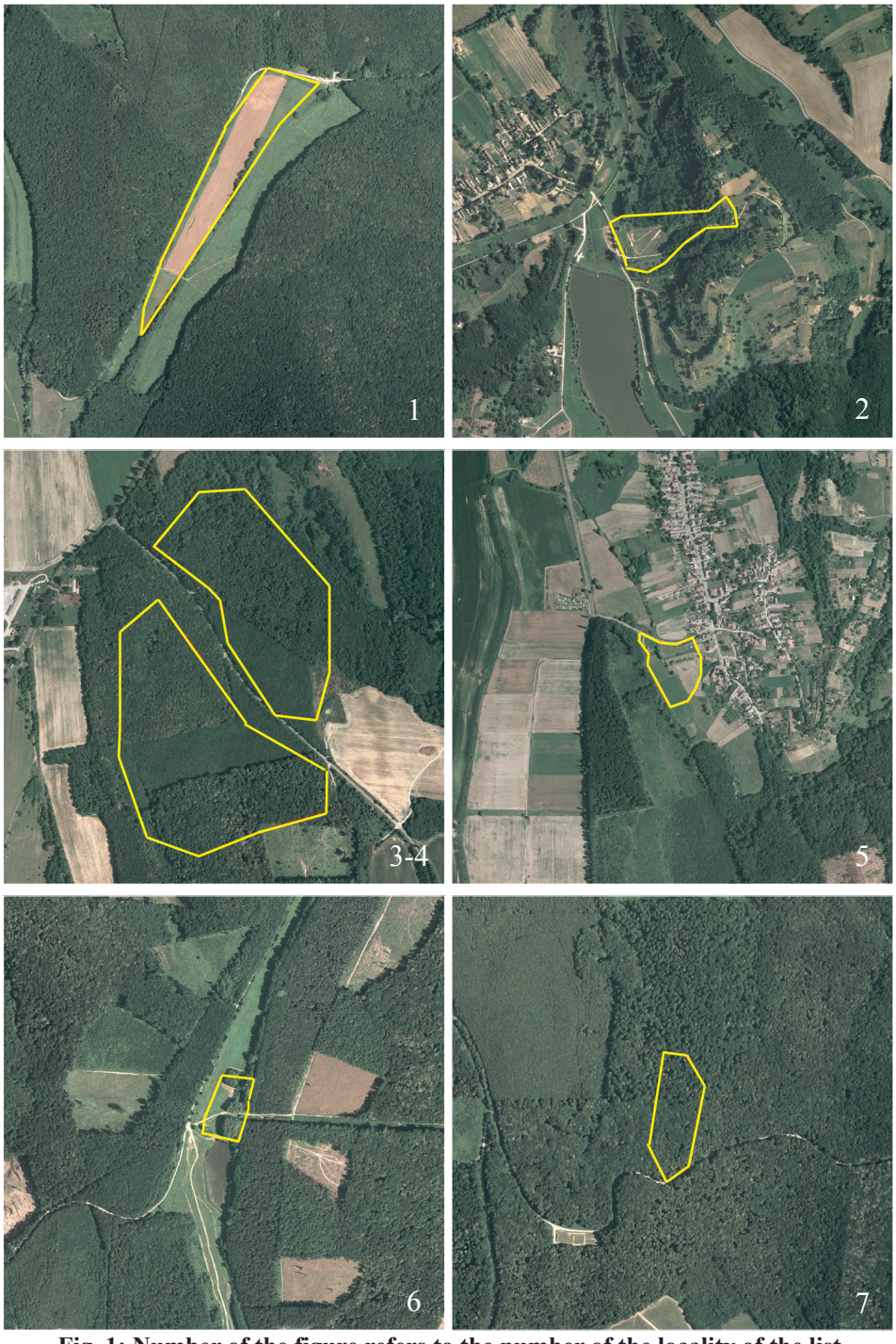
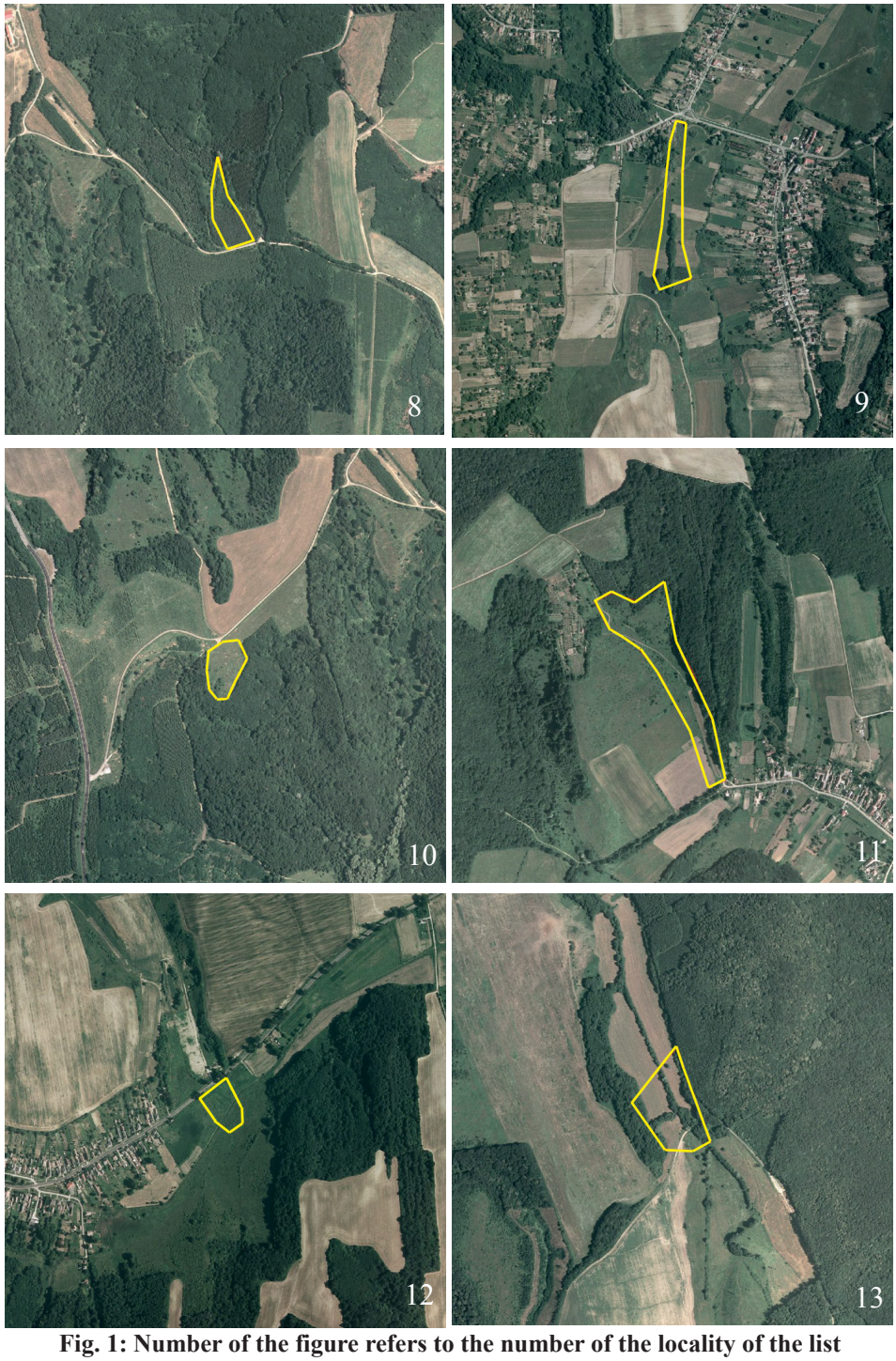


Fig. 1: Number of the figure refers to the number of the locality of the list



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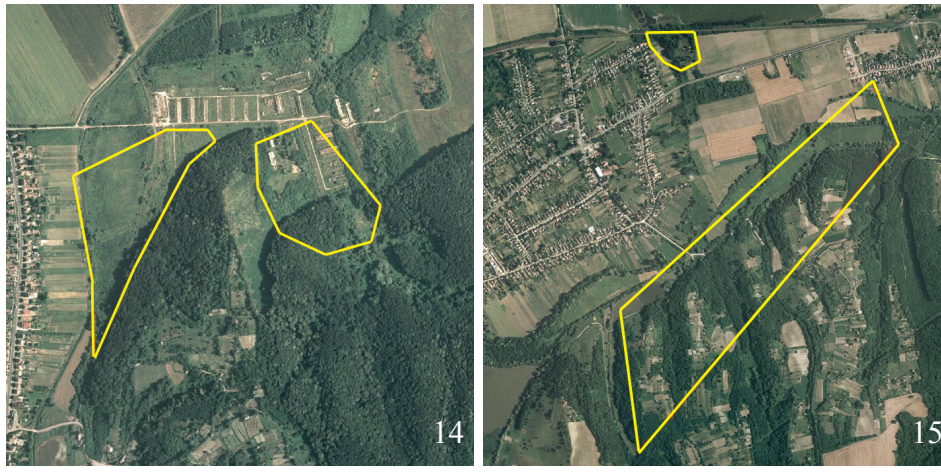

Fig. 1: Number of the figure refers to the number of the locality of the list

14.39" E and 46º 18' 31.41" N, 17° 54' 17.90" E.

34. Zselickisfalud: Kardosfa: towards Millenium Memory Linden Forest. 02. 05. 2009, 10. 05. 2009, 30. 05. 2009 and 15. 08. 2009. Around 46° 14' 42.24' N, 17° 45' 15.48" E.

35. Simonfa: Cserénfa-Simonfa forestry road, 2.1 km from Simonfa (road 67), sweeping on Salix. 03. 05. 2009. Around 46º 16' 13.21" N, 17° 50' 38.20" E.

36. Zselickisfalud: Ropoly forestry road, 4 km from the road 67. 08. 05. 2009. Between 46º 15' 36.30" N, 17° 47' 52.43" E and 46º 15' 45.09" N, 17° 48' 02.29" E.

37. Hajmás: hill before village, at right side of the road. 08. 05. 2009 and 23. 05. 2009. Between 46º 15' 42.55" N, 17° 54' 29.83" E and 46º 15' 33.92" N, 17° 54' 48.78" E.

38. Kaposvár: young fir plantation at the right side of road 67 towards Zselickislak. 09. 05. 2009. Around 46º 19' 52.31" N, 17° 47' 56.36" E.

39. Terecsény: forest, 700 m from the road 67. 09. 05. 2009. Between 46º 13' 08.81" N, 17° 51' 28.12" E and 46º 13' 19.03" N, 17° 51' 25.25" E.

40. Simonfa. Forestry road. 09. 05. 2009. Around 46º 16' 13.21" N, 17° 50' 38.20" E.

41. Cserénfa: Fürteleki forest. Forestry road (Sefag) North of Cserénfa, close to Sántos. 2.4 km from road 66. 23. 05. 2009. Between 46º 19' 32.47" N, 17° 51' 42.16" E and 46º 19' 28.04" N, 17° 51' 34.78" E.

42. Bánya: lake, fir plantation. 24. 05.2009 and 30. 05. 2009. Between 46º 16' 15.05" N, 17° 40' 10.46" E and 46º 16' 11.80" N, 17° 40' 08.71" E.

43. Gálosfa: Vörös alma lake, edge of forest (Fig. 3). 10. 08. 2009 and 15. 08. 2009 Between 46º 14' 56.02" N, 17° 51' 56.03" E and 14' 56.48" N, 17º 51' 49.60" E.

List of species

Symphyta

Pamphilidae

Cephalcia abietis (Linné, 1758): Zselickislak, 15. 05. 2009, 1♂ - Hostplant: *Picea abies*. Sporadic.

Pamphilius ignymontiensis Lacourt, 1973: Zselicszentpál, 03. 05. 2009, 1♀ - Recently separated from *Pamphilius aurantiacus* (Giraud, 1857). Rare. Known hostplants: *Acer platanoides* and *A. campestre*.

Pamphilius sylvaticus (Linné, 1758): Kaposmérő, 16. 05. 1992, 1♀, Lad: Kótai forest (Kótai-erdő), 04. 05. 1994, 1♀, Zseliskislak, 08. 05. 2009, 1♂ - One of the commonest sawfly species. Hostplants: *Sorbus aucupariae*, *Malus* spp., *Prunus* spp. and *Crataegus* spp.

Megalodontesidae

Megalodontes laticeps Konow, 1897: Gyűrűfű, 21. 05. 2006, 1♂ - Sporadic In Hungary. Hostplant Unknown.

Megalodontes plagiocephalus (Fabricius, 1804): Gyűrűfű, 20-22. 05. 2006, 3♀, 22-23, 06. 2007, 1♂, Kaposgyarmat, 15. 05. 2009, 1♀ - One of the most frequent Megalodontesidae species. Known hostplant: *Peucedanum alsaticum*.

Xiphidridae

Xiphidria camelus (Linné, 1758): Kaposmérő, 05. 05. 0991, 1♂ - Sporadic. Hostplants: *Betula* and *Alnus* spp.

Siricidae

Urocerus gigas gigas (Linné, 1758): Kaposvár, 13. 06. 1951, 1♀ - Widely distriburted insect pest of timber and wood but not common in Hungary. This old specimen is from the Nattán Collection deposited in the Hungarian Natural History Museum. Larva lives in *Pinus, Picea, Larix* and *Abies* spp. but also reared from *Populus* and *Fraxinus* spp. (based on very old dubious records).

Tremex fuscicornis (Fabricius, 1787): Kaposvár, 15. 09. 2006, 1♀ - Widely distributed but not common in Hungary. Hostplants: *Fagus, Acer, Salix, Betula, Populus* and *Ulmus* spp.

Cephidae

Calameuta (Calameuta) filiformis (Eversmann, 1847): Kaposmérő, 13. 04. 1991, 1♀, 07. 06. 1991, 1♀, 15. 06. 1991, 1♂, 31. 05. 1991, 1♂, Bőszénfa: Farkaslaki forest (Farkaslaki-erdő), 23. 05. 1997, 1♂, Gyűrűfű, 20-22. 05. 2006, 2♂, Kaposszentbenedek, 10. 05. 2009, 1♀, Zselickisfalud: Kardosfa, 10. 05. 2009, 2♀, Hajmás, 23. 05. 2009, 1♀, Simonfa: fenyves, 08. 05. 2009, 1♀ - Common species. Larva lives in stems of *Arrhenaterum elatius, Phalaris arundinacea, Calamagrostis epigeios, Elytrigia repens* and *Phragmites communis*.

Calameuta (Calameuta) haemorrhoidalis (Fabricius, 1781): Kaposmérő, 10. 05. 1991, 1♀, 23. 05. 1991, 1♀, 25. 05. 1991, 1♀, 02. 05. 1992, 1♀, 1♂, Gyűrűfű, 20-22. 05. 2006, 1♀, 1♂ - Frequent species. Hostplant unknown.

Calameuta (Calameuta) pallipes (Klug, 1803): Gyűrűfű, 20-22. 05. 2006, 1♂, 1♀, Simonfa: rét, 25. 04. 2009, 2♀, 1♂, Bőszénfa: Ropoly pond (Ropoly: tó), 01. 05. 2009, 1♀, Zselicszentpál, 03. 05. 2009, 1♀, Bőszénfa: Ropoly: tó, 08. 05. 2009, 1♀, Sántos, 23. 05. 2009, 1♀ - Frequent species. Hostplants: diverse *Graminae*.

Calameuta (Calameuta) punctata (Klug, 1803): Zselickisfalud: towards Szilvásszentmárton, 18. 04. 2009, 1♀ - Sporadic in Hungary.

Cephus brachycercus C. G. Thomson, 1871: Kaposmérő, 05. 05. 1991, 1♀ - Widely distributed, sporadic species. Hostplant unknown.

Cephus spinipes (Panzer, 1800) (syn. *Cephus cultratus* Eversmann, 1847): Kaposmérő, 31. 05. 1991, 1♂, Hajmás, 08. 05. 2009, 1♀, Kaposszentbenedek, 10. 05. 2009, 1♀, Zselickislak, 15. 05. 2009, 1♀, Kaposgyarmat, 15. 05. 2009, 1♀, Sántos, 23. 05. 2009, 1♀ - Frequent species. Known hostplant: *Phleum pratense.*

Cephus nigrinus C. G. Thomson, 1871: Kaposmérő, 12. 05. 1991, 1♀, 02. 05. 1992, 2♀, Gálosfa:

Fig. 2: Zselic landscape: Festetich house in Gálosfa (XVIII. c.)

Fig. 3: Zselic landscape: Vörösalma pond and forester's lodge

Fig. 4: Zselic landscape: Szentbalázs hills

Fig. 5: Zselic landscape: Szenna: Denna meadow

village, 24. 04. 2009, 1♂, Zselickislak, 25. 04. 2009, 1♀, 01. 05. 2009, 1♀, 1♂, 15. 05. 2009, 1♀, Bőszénfa: Ropoly fishing pond (Ropoly: tó), 01. 05. 2009, 1♀ - Frequent species. Hostplants: *Milium effusum* and *Poa pratensis.*

Cephus pygmeus (Linné, 1767): Kaposmérő, 31. 05. 1991, 1♀, 1♂, 23. 06. 1991, 1♂, 16. 05. 1992, 1♂, Szentbalázs: Nagy-Bicó, 03. 05. 2009, 2♀, Szentbalázs: Herceg-képe, 15. 05. 2009, 1♀, Zselickislak, 30. 05. 2009, 1♀ - Common. Insect pest of cereals and *Graminae*.

Hartigia linearis (Schrank, 1781): Cserénfa, 30. 06. 1998, 1♀ - Sporadic. Larva feeds on *Agrimonia eupatoria*.

Hartigia nigra (Harris, 1776): Zselicszentpál, 09. 05. 2009, 1♀ - Sporadic in Hungary. Hostplants: *Rosa* and *Rubus* spp.

Argidae

Aproceros leucopoda Takeuchi, 1939: Szenna: Denna meadow (Dennai rét), 26. 04. 2009, 2♀ - Larva on *Ulmus* spp.

Arge berberidis Schrank, 1802: Kaposvár: Zaranyi forest, 19. 06. 1989, 1♀, 23. 07. 1991, 1♀, Kaposszentbenedek, 09. 08. 2009, 1♂ - Frequent in Hungary but rare in Zselicség. Larva on *Berberis* and *Mahonia* spp.

Arge cyanocrocea (Forster, 1771): Kaposmérő, 31. 07. 1990, 1♂, 15. 06. 1991, 1♀, 17. 07. 1991, 1♀, 25. 07. 1991, 1♀, 09. 08. 1991, 2♀, 15. 06. 1992, 1♂, Szenna: village, 24. 05. 2009, 3♀, 3♂, 12. 07. 2009, 1♀, 1♂, Szenna: Denna meadow (Dennai rét), 30. 05. 2009, 1♀, Kaposszentbenedek, 10. 05. 2009, 1♀, 14. 07. 2007, 1♂, Zselickislak, 20. 06. 2009, 1♀, 1♂, Sántos, 06. 06. 2009, 1♀ - Common species. Known hostplants: *Rubus idaeus* and *Sanguisorba officinalis*.

Arge enodis (Linné, 1767): Kaposmérő, 09. 07. 1990, 1♀, 17. 07. 1990, 1♀, 21. 07. 1990, 1♀, 21. 07. 1991, 1♀, 25. 07. 1991, 4♀, 31. 07. 1991, 1♀, 1♂, 01. 08. 1991, 1♀, 09. 08. 1991, 1♀, 12. 08. 1991, 2♂; Kaposvár: Zaranyi forest: 19. 06. 1989, 1♀, Zselickislak, 01. 05. 2009, 1♀, Kaposszentbenedek, 12. 07. 2009, 2♀, 1♂, 19. 07. 2009, 5♀, 2♂, Szenna, village, 12. 07. 2009, 1♂, Zselickisfalud: Ropoly, 09. 08. 2009, 1♀ - One of the commonest sawflies of the Zselic Hills. Hostplants: *Salix* spp.

Arge gracilicornis (Klug, 1814): Kaposmérő, 10. 08. 1990, 1♂ - Sporadic. Larva on *Rubus idaeus*.

Arge melanochra (Gmelin, 1790): Kaposmérő, 22. 07. 1990, 1♀, 17. 07. 1991, 1♂, 1♀, 19. 07. 1991, 1♂, 1♀, 21. 07. 1991, 1♀, 31. 07. 1991, 1♂, 01. 08. 1991, 1♀, 09. 08. 1991, 1♂, 24. 05. 1992, 1♂; Kaposvár: Zaranyi forest, 25. 07. 1991, 1♀, Kaposszentbenedek, 10. 05. 2009, 1♀, Szenna: village, 24. 05. 2009, 3♀, 3♂, 12. 07. 2009, 1♀, 2♂, Szenna: Denna meadow (Dennai rét), 30. 05. 2009, 1♀, Zselickislak, 06. 06. 2009, 2♀, 1♂, Sántos, 06. 06. 2009, 1♀, Szenna: loess mine (löszfeltárás), 14. 07. 2007, 1♂, Szenna: Gályi brook (Gályi-patak), 14. 07. 2007, 1♂ - The commonest Argid sawfly of the Zselic Hills. Hostplant: *Crataegus oxycantha*.

Arge ochropus (Gmelin, 1790): Szenna: village (falu vége), 12. 07. 2009, 1♀ - Insect pest of *Rosa* spp. but not common.

Arge nigripes (Retzius, 1783): Kaposmérő, 01. 08. 1991, 1♂, 09. 08. 1991, 1♀ - Sporadic. Hostplants: *Rosa* spp.

Arge pagana pagana (Panzer, 1798): Kaposmérő, 25. 07. 1991, 1♂, 01. 08. 1991, 1♀, 07. 06. 1992, 1♀, Kaposszentbenedek, 12. 07. 2009, 2♀, 1♂, Sántos, 10. 08. 2009, 1♂ - Frequent. Hostplants: *Rosa* spp.

Arge rustica (Linné, 1758): Kaposmérő, 08. 08. 1991, 1♀, Kaposvár: Cseri-dűlő, 10. 08. 2008, 1♀ - Sporadic. Hostplant: *Quercus* spp.

Sterictiphora angelicae (Panzer, 1799): Kaposszentbenedek, 12. 07. 2009, 1♂, 19. 07. 2009, 1♂, Kaposgyarmat, 18. 07. 2009, Szenna, loess mine (löszfeltárás), 14. 07. 2007, 1♂ - Frequent species.

Cimbicidae

Abia nitens (Linné, 1758): Kaposmérő, 31. 07. 1990, 1♀ - Less frequent than next species. Hostplants: *Scabiosa columbaria* and *S. canescens*.

Abia sericea (Linné, 1767): Kaposmérő, 19. 07. 1991, 1♀, 21. 07. 1991, 1♀, 31. 07. 1991, 2♀, 09. 08. 1991, 1♂, 10. 08. 1991, 1 - Frequent. Larva on *Succisa, Knautia* and *Fragaria* spp.

Cimbex femoratus (Linné, 1758): Kaposvár, July of 1997 (no day), 1♂ - Widely distributed but not frequent in the Zselic Hills. Hostplants: *Betula pendula* and *B. pubescens*.

Cimbex luteus (Linnaeus, 1758): Szenna, 04. 06. 2002, 1♀ - Sporadic. Larva on *Populus tremula* and *Salix* spp.

Cimbex quadrimaculatus (O. F. Müller, 1766): Kaposmérő, June (no day). 1985, 1♀, Kaposvár, 01. 05. 1987, 1♀, Kaposvár: Zaranyi forest, 19. 06. 1989, 1♂, Kiskorpád, 25. 06. 1991, 1♀ - Frequent insect pest. Larva on *Crataegus, Pyrus* and *Prunus* spp.

Corynis crassicornis (Rossi, 1790): Kisasszond: built in area (belterület), 26. 04. 2006, 1♀ - Sporadic. Hosts are *Sedum* spp. (*S. album, S. acre* and *S. sexangulare*) (LISTON 1997).

Diprionidae

Diprion pini (Linné, 1758): Kaposvár: Zaranyi forest, 19. 06. 1989, 1♀, Bánya, 24. 05. 2009, 1♂, Zselickislak, 06. 06. 2009, 1♂, 20. 06. 2009, 1♂, 09. 08. 2009, 1♂ - Frequent. Insect pest of *Pinus* spp.

Gilpinia laricis (Jurine, 1807): Visnyeszéplak, 23. 06. 1985, 1♀ - Rare. Larva on *Pinus* spp.

Tenthredinidae

Allantinae

Allantus (Emphytus) calceatus (Klug, 1818): Kaposmérő, 29. 06. 1991, 1♀, Kaposvár: Toponár: built in area (belterület), 27. 08. 1996, 1♀ - Sporadic. Hostplants: *Rubus, Sanguisorba, Rosa, Filipendula, Fragaria* and *Alchemilla* spp.

Allantus (Emphytus) cinctus (Linné, 1758): Kaposvár: Zaranyi forest, 19. 06. 1989, 1♀, Kaposmérő, 03. 05. 1992, 1♀, Gyűrűfű, 21. 05. 2006, 1♂, Szentbalázs: Herceg-képe, 25. 04. 2009, 1♂, Zselicszentpál, 03. 05. 2009, 1♀ - Frequent. Hostplants: *Rosa* spp.

Allantus (Emphytus) cingulatus (Scopoli, 1763): Szenna: Denna meadow (Dennai rét), 26. 04. 2009, 1♂, Zselickislak, 01. 05. 2009, 1♀, 08. 05. 2009, 1♀, Simonfa: Tótyai dülő, 03. 05. 2009, 1♂, Kaposgyarmat, 15. 05. 2009, 1♀ - Frequent. Larva on *Fragaria* and *Rosa* spp.

Allantus (Emphytus) didymus (Klug, 1818): Gyűrűfű, 21. 05. 2006, 1♀ - Sporadic. Larva on *Sanguisorba minor* and probably *Rubus* and *Rosa* spp.

Allantus (Emphytus) melanarius (Klug, 1818): Kaposvár: Zaranyi forest, 19. 06. 1989, 1♀, Kaposmérő, 26. 07. 1992, 1♀, Zselickislak, 08. 05. 2009, 1♀, Simonfa: Messzelátó, 21. 04. 2007, 1♀ - Frequent. Hostplant: *Cornus sanguinea*.

Ametastegia (Protemphytus) carpini (Hartig, 1837): Zselickislak: Borgyan, 21. 04. 2007, 1♂ - Sporadic. Hostplant: *Geranium* spp.

Ametastegia (Ametastegia) equiseti (Fallén, 1808): Kaposmérő, 31. 08. 1991, 1♀, Gyűrűfű, 22. 06. 2007, 1♀, 1♂ - Frequent. Larva on *Chenopodium album*, *Lythrum salicaria*, *Polygonum persicaria* and

Fig. 6: ***Tenthredo* (*Maculedo*) *vespiformis* Schrank, 1781**

Fig. 7: ***Stromboceros delicatulus* (Fallén, 1808)**

Fig. 8: ***Macrophya* (*Macrophya*) *tenella* Mocsáry, 1881**

Fig. 9: ***Paracharactus* (*Dicrostema*) *gracilicornis* (Zaddach, 1859)**

Fig. 10: ***Pamphilius ignymontiensis* Lacourt, 1973**

Fig. 11: ***Aproceros leucopoda* Takeuchi, 1939**

Rumex acetosella.

Ametastegia (Protemphytus) tenera (Fallén, 1808): Kaposmérő, 08. 04. 1992, 1♂, 28. 06. 1992, 1♀, Kaposvár: Tókaj (in litt. Roller and Haris, 2008) - Frequent. Larva on *Rumex* spp.

Athalia bicolor Serville, 1823: Kaposmérő, 31. 05. 1991, 1♂, 16. 05. 1992, 1♂, Kaposgyarmat, 01. 05. 2009, 1♀, Zselicszentpál, 09. 05. 2009, 1♀, Kaposszentbenedek, 10. 05. 2009, 1♀, Szenna: Denna meadow (Dennai rét), 16. 05. 2009, 1♀, Sántos, 23. 05. 2009, 1♀ - Frequent. Hostplant: *Ranunculus* spp.

Athalia circularis (Klug, 1815): Kaposmérő, 15. 07. 1990, 1♀, 20. 08. 1990, 1♀, 19. 07. 1991, 1♂, 08. 08. 1991, 1♂, 24. 05. 1992, 1♀, 17. 06. 1992, 1♂, Gyűrűfű, 21. 05. 2006, 1♀, Zselickislak, 23. 05. 2009, 1♂, Gyűrűfű (in lit. Roller and Haris, 2008) - Frequent. Hostplants: *Arctium lappa, Ajuga reptans, Veronica beccabunga, V. longifolia, V. officinalis, Alliaria petiolata, Glechoma hederacea, Melampyrum, Capsella* and *Lycopus* spp.

Athalia cornubiae Benson, 1931: Kaposmérő, 31. 07. 1991, 1♀, Hajmás, 08. 05. 2009, 1♀ - Rare. Hostplant: *Sedum album*.

Athalia cordata Serville, 1823: Kaposvár: Zaranyi forest, 23. 07. 1991, 1♀, Kaposmérő, 04. 07. 1990, 1♀, 1♂, 28. 04. 1991, 1♂, 12. 05. 1991, 1♂, 16. 05. 1992, 2♀, 27. 06. 1992, 1♀, Kaposfő, 10. 05. 1991, 1♂, Kaposszentbenedek, 10. 04. 2009, 1♀, 19. 04. 2009, 1♀, 1♂, Zselickislak, 25. 04. 2009, 1♀, 15. 05. 2009, 1♀, 1♂, Szentbalázs: Herceg-képe, 25. 04. 2009, 1♂, Szenna: Denna meadow (Dennai rét), 26. 04. 2009, 2♀, Bőszénfa: Ropoly, 01. 05. 2009, 1♀, Zselicszentpál, 03. 05. 2009, 1♀, Hajmás, 08. 05. 2009, 1♂, Zselickisfalud: on ferns towards Ropoly, 18. 07. 2009, 1♂ - Common. Larva on *Misopates orontinum, Antirrhinum majus, Ajuga reptans, Teucrium scorodonia* and *Plantago* spp.

Athalia liberta (Klug, 1815): Kaposmérő, 25. 07. 1991, 1♀, 31. 07. 1991, 2♂, 01. 08. 1991, 1♀, 09. 08. 1991, 1♀, 25. 05. 1992, 1♀, Szentbalázs: Nagy-Bicó, 03. 05. 2009, 1♂, Szentbalázs: Herceg-képe, 25. 04. 2009, 1♂, Zselickislak, 23. 05. 2009, 1♂ - Frequent. Feeding on *Alliaria petiolata, Arabidopsis thaliana, Cardamine hirsuta* and *Sisymbrium officinale*.

Athalia lugens (Klug, 1815): Kaposmérő, 29. 06. 1991, 1♂, 31. 07. 1991, 1♀, 1♂, 26. 07. 1992, 1♀, Kaposszentbenedek, 19. 07. 2009, 1♀ - Sporadic. Feeding on various *Cruciferae*.

Athalia rosae (Linné, 1758): Kaposmérő, 15. 07. 1990, 1♂, 13. 07. 1991, 1♀, 19. 07. 1991, 1♀, 31. 08. 1991, 1♀, 17. 06. 1992, 1♀, 28. 06. 1992, 2♀, Kaposvár: Zaranyi forest, 23. 07. 1991, 1♂, 3♀, Sántos, 23. 05. 2009, 1♂, 10. 08. 2009, 2♀, 1♂, Szenna: Denna meadow (Dennai rét), 24. 05. 2009, 1♀, 30. 05. 2009, 1♂, 15. 08. 2009, 1♂, Szenna: loess mine (löszfeltárás), 14. 07. 2007, 1♀, Zselickisfalud: Kardosfa, 30. 05. 2009, 1♀, Zselickislak, 12. 07. 2009, 1♂, 09. 08. 2009, 3♀, Kaposszentbenedek, 12. 07. 2009, 3♀, 19. 07. 2009, 2♀, 09. 08. 2009, 4♀, 3♂ - Common insect pest. Hostplants: *Raphanus sativus, R. raphanistrum, Sinapis arvensis, Sisymbrium officinale. Armoracia rusticana, Barbarea* sp.*, Brassica napus, B. juncea, B. rapa, B. oleracea, Tropaeolum majus, Sinapis arvensis, Alliara petiolata* and *Cardamine* spp.

Caliroa cerasi (Linné, 1758): Kaposmérő, 29. 06. 1992, 1♀ - Sporadic pest. Larva on *Prunus cerasi, P. avium, P. padus, P. spinosa ,Cotoneaster sp., Malus* spp., *Betula* spp., *Mespilus germanica, Quercus* spp., *Rosa* spp., *Rubus* spp., *Salix* spp., *Amelanchier lamarckii, Crataegus monogyna, Cydonia oblonga, Pyrus communis, Sorbus aucuparia, Padus* spp. and *Persica vulgaris*.

Empria sexpunctata (Serville, 1823) (syn.: *Empria klugii* (Stephens, 1835)): Szentbalázs: Herceg-képe, 25. 04. 2009, 1♀, Simonfa, Tótyai-dűlő, 09. 05. 2009, 1♀, Kaposvár: Tókaj (in lit. Roller and Haris, 2008) - Frequent. Larva on *Geum* spp.

Empria liturata (Gmelin, 1790): Szenna: Dennai forester's lodge (erdészház), 03. 04. 2009, 1♂, Zselickisfalud: Enyezdi barrack, 10. 04. 2009, 2♀, 1♂, Kaposszerdahely, 12. 04. 2009, 1♀, Zselicszentpál, 18. 04. 2009, 1♀, Zselickisfalud: ferns towards Ropoly, 18. 04. 2009, 1♂, 01. 05. 2009, 1♀, Bőszénfa: Ropoly fishing pond (Ropoly: tó), 11. 04. 2009, 1♀, Szentbalázs: Herceg-képe, 25. 04. 2009, 1♀, Kaposszentbenedek,

26. 04. 2009, 1♀ - Frequent. Hostplants: *Fragaria* and *Geum* spp.

Empria tridens (Konow, 1896): Cserénfa: Irafai forest (Irafai-erdő), 12. 04. 2009, 2♀, Zselicszentpál, 03. 05. 2009, 1♀ - Frequent. Hostplants: *Geum* spp. and *Rubus idaeus*.

Eriocampa ovata (Linné, 1761): Kaposmérő, 15. 06. 1991, 1♀, 31. 07. 1991, 1♀, Szenna: Denna meadow (Dennai rét), 30. 05. 2009, 2♀ - Frequent on *Alnus glutinosa* and *A. incana*.

Eriocampa umbratica (Klug, 1816): Bőszénfa: Ropoly: tó, 04. 24. 2009, 1♀, 01. 05. 2009, 1♀, 6♂, 08. 05. 2009, 1♀, 1♂ - Frequent on *Alnus glutinosa* and *A. incana*.

Harpiphorus lepidus (Klug, 1818): Szentbalázs: Nagy-Bicó, 03. 05. 2009, 1♀ - Rare. Hostplants: *Quercus* spp.

Monostegia abdominalis (Fabricius, 1798): Kaposmérő, 07. 06. 1991, 1♀ - Sporadic. Recorded on *Glaux maritima*, *Lysimachia numularia* and *L. vulgaris*.

Monostegia nigra (Konow, 1896): Kaposmérő, 07. 08. 1991, 1♀ - Sporadic. Hostplant: *Lysimachia punctata*.

Monsoma pulveratum (Retzius, 1783): Zselickisfalud: ferns towards Ropoly, 18. 04. 2009, 1♀ - Sporadic. Living on *Alnus* and *Salix* spp.

Taxonus agrorum (Fallén, 1808): Kaposmérő, 16. 06. 1991, 1♂, 14. 07. 1991, 1♂, Simonfa: fir forest, 25. 04. 2009, 2♂ - Frequent. Hostplant: *Rubus idaeus*.

Selandrinae

Birka cinereipes (Klug, 1816): Gyűrűfű, 22-23. 06. 2007, 1♂ - Sporadic. Hostplants: *Myosotis* spp.

Nesoselandria morio (Fabricius, 1781): Kaposmérő, 31. 05. 1991, 1♂, 16. 05. 1992, 1♂, 24. 05. 1992, 1♀, 07. 06. 1992, 1♀, Zselickislak, 23. 05. 2009, 1♂, Gyűrűfű (in lit. ROLLER and HARIS 2008) - Frequent. Hostplants: *Brachytecium reflexum, Ceratodon purpureus, Chenopodium album, Dicranum scoparium, Fragaria vesca, Hedwigia ciliata, Myosotis arvensis, Plagiomnium cuspidatum, Plagiothecium denticulatum, Polygonum aviculare, Polytrichum commune, Pseudobryum cinclidiodes, Sanionia uncinata, Stellaria media, Veronica chamaedrys* and *V. officinalis*.

Selandria serva (Fabricius, 1793): Kaposmérő, 31. 07. 1990, 1♂, 24. 08. 1990, 1♀, 09. 08. 1991, 1♀, 12. 08. 1991, 1♂, 31. 08. 1991, 1♀, 14. 07. 2007, 1♂, Gyűrűfű (in lit. ROLLER and HARIS 2008. - Frequent. Host plants: *Poaceae, Carex* spp. and *Juncus* spp.

Stromboceros delicatulus (Fallén, 1808): Cserénfa: Könyökes, 24. 04. 2009, 1♀, Zselickisfalud, ferns towards Ropoly, 12. 07. 2009, 1♂ - Rare. Larva on *Pteridium aquilium, Athyrium filix-femina, Onoclea struthiopteridis* and *Polypodium vulgare*.

Dolerinae

Dolerus (Dolerus) bajulus Serville, 1823: Kaposmérő, 12. 05. 1991, 1♀, 01. 08. 1991, 1♀, 03. 08. 1991, 1♀, 12. 08. 1991, 1♀, 18. 07. 1992, 1♂ - Frequent. Hostplants: *Equisetum* spp.

Dolerus (Poodolerus) aeneus Hartig, 1837: Bőszénfa: Ropoly fishing pond (Ropoly: tó), 18. 04. 2009, 1♀, 1♂ - Sporadic. Hostplants: *Graminae*.

Dolerus (Poodolerus) anthracinus (Klug, 1818): Kaposmérő: marshi meadow at River Kapos (mocsárrét a Kapos partján), 23. 03. 1991, 1♀, Zselickisfalud: Enyezdi barrack, 03. 04. 2009, 1♀ - Sporadic. Hostplants: *Graminae*.

Dolerus (Poodolerus) asper Zaddach, 1859: Kaposmérő, 18. 04. 1992, 1♀ - Sporadic.

Hostplants: *Graminae* and *Cyperaceae*.

Dolerus (Poodolerus) blanki Liston, 1995: Kaposvár: Tókaji forest (Tókaji parkerdő), 10. 04. 1994, 1♂ - Rare.

Dolerus (Dolerus) bimaculatus (Geoffroy, 1785): Kaposmérő, 16. 05. 1992, 1♀ - Sporadic. Larva on *Equisetum* spp.

Dolerus (Poodolerus) brevicornis Zaddach, 1859: Kaposvár (in litt. Roller and Haris, 2008), Kaposszentbenedek, 10. 04. 2009, 1♀ - Sporadic. Larva on *Graminae*.

Dolerus (Oncodolerus) eversmanni W. F. Kirby, 1882: Kaposvár: Tókaji forest (Tókaji parkerdő), 10. 04. 1994, 1♂, Kaposgyarmat: old railway (régi vasút), 10. 04. 2009, 2♂, Zselickislak, 25. 04. 2009, 1♂, 01. 05. 2009, 1♂ - Frequent. Larva on *Equisetum arvense* and *E. palustre*.

Dolerus (Dolerus) germanicus (Fabricius, 1775): Kaposmérő, 05. 05. 1991, 2♂, 20. 05. 1991, 2♀, 19. 08. 1991, 1♀, 17. 05. 1992, 1♀, 23. 06. 1992, 1♀, 18. 07. 1992, 1♀, Gyűrűfű, 20-22. 05. 2006, 3♀, 1♂, Zselicszentpál, 18. 04. 2009, 2♂, 03. 05. 2009, 1♀, 22-23. 06. 2007, 1♀, Zselickislak, 25. 04. 2009, 2♂, 01. 05. 2009, 1♂, Kaposgyarmat, 15. 05. 2009, 1♀, Kaposszentbenedek, 12. 07. 2009, 1♀, Szenna: village, 12. 07. 2009, 1♀, Szenna: valley of Gályi brook (Gályi-patak völgye), 14. 07. 2007, 1♂, Kaposvár (in lit. ROLLER and HARIS 2008) - Common. Larva on *Equisetum arvense* and *E. palustre*.

Dolerus (Poodolerus) gonager (Fabricius, 1781): Kaposmérő: Jókai str.. 9., 13. 04. 1991, 1♀, Kaposvár: Zaranyi forest, 19. 06. 1989, 1♂, Gálosfa: village, 12. 04. 2009, 1♀, Zselickislak, 25. 04. 2009, 1♀, Szenna: Denna meadow (Dennai-rét), 26. 04. 2009, 1♀, Simonfa: fir forest, 03. 05. 2009, 1♀, Bőszénfa (in lit. Roller and Haris, 2008) - Common. Larva on *Graminae*.

Dolerus (Poodolerus) niger (Linné, 1767): Kaposmérő, 25. 07. 1992, 1♀ - Sporadic. Larva on *Graminae*.

Dolerus (Poodolerus) nigratus (O. F. Müller, 1776): Kaposmérő, 10. 05. 1991, 1♀, 12. 05. 1991, 2♀, 04. 04. 1991, 2♀, 26. 04. 1991, 2♂, 05. 04. 1992, 1♀, 08. 04. 1992, 1♀, 18. 04. 1992, 1♂, 25. 04. 1992, 1♀, 02. 05. 1992, 1♀, Kaposmérő: at River Kapos (Kapos part): 23. 03. 1991, 2♂, 13. 04. 1991, 1♀, Kaposvár: Zaranyi forest: 19. 06. 1989, 2♂, Szenna: Denna forester's lodge (Dennai erdészház), 03. 04. 2009, 2♀, Zselickisfalud:)Keleti.Gyöngyös brook) Keleti Gyöngyös-patak, 03. 04. 2009, 1♂, Zselickisfalud, Enyezdi barrack, 03. 04. 2009, 1♂, 10. 04. 2009, 2♀, 1♂, Szenna: Denna meadow (Dennai-rét), 04. 04. 2009, 1♀, 1♂, Zselickisfalud: Kardosfa, 04. 04. 2009, 1♀, Szenna: village, 04. 04. 2009, 1♀, 12. 04. 2009, 1♀, Bánya: lake (tópart), 05. 04. 2009, 2♀, Kaposszentbenedek, 10. 04. 2009, 3♀, 19. 04. 2009, 1♀, Bőszénfa: Ropoly, 11. 04. 2009, 1♀, 1♂, Zselicszentpál, 18. 04. 2009, 3♀, 1♂, Gálosfa: village, 24. 04. 2009, 2♀, Zselickislak, 15. 05. 2009, 1♀ - Common. Larva on *Graminae including* cereals.

Dolerus (Poodolerus) nitens Zaddach, 1859: Kaposmérő: marshi meadow at River Kapos (Kapospart: láprét), 23. 03. 1991, 2♀, Szenna: Denna: forester's lodge (Dennai erdészház), 03. 04. 2009, 1♂, Zselickisfalud: Enyezdi barrack, 03. 04. 2009, 2♀, 10. 04. 2009, 1♀, Szenna: Denna meadow (Dennai rét), 04. 04. 2009, 2♀ - Frequent. Larva on *Cyperaceae* and *Graminae*.

Dolerus (Poodolerus) picipes (Klug, 1818): Kaposmérő, 13. 04. 1991, 1♀, 26. 04. 1991, 1♀, 05. 05. 1991, 1♀, 02. 05. 1992, 1♀ - Frequent. Larva on *Graminae*.

Dolerus (Poodolerus) puncticollis C. G. Thomson, 1871: Kaposmérő, 17. 03. 1990, 1♂, 14. 04. 1990, 1♂, 01. 04. 1991, 1♂, Kaposvár: Zaranyi forest: 19. 06. 1989, 1♀, 1♂, Szenna: Denna: forester's lodge (Dennai erdészlak), 03. 04. 2009, 1♀, 1♂, Zselickisfalud: Keleti-Gyöngyös brook (Keleti Gyöngyös patak), 03. 04. 2009, 3♂, Zselickisfalud: Enyezdi barrack, 03. 04. 2009, 1♀, 10. 04. 2009, 1♂, Kaposszentbenedek, 05. 04. 2009, 1♂, 10. 04. 2009, 1♀, Bánya: lake (tópart), 05. 04. 2009, 1♂, Bőszénfa: Ropoly: clearing, 11. 04. 2009, 1♀, Gálosfa: village, 12. 04. 2009, 1♀ - Common. Larva on *Graminae including* cereals.

Dolerus (Poodolerus) sanguinicollis (Klug, 1818): Kaposfő, 18. 05. 1983, 1♀ - Sporadic.

Dolerus (Achaetoprion) triplicatus (Klug, 1818): Kaposmérő: at River Kapos: marshi meadow, 13. 04. 1991, 1♂ - Sporadic. Larva on *Juncus filiformis* and *J. effusus*.

Dolerus (Dicrodolerus) vestigialis (Klug, 1818): Kaposmérő, 24. 05. 1992, 1♀, Gyűrűfű, 20-22. 05. 2006, 2♀, Zselicszentpál, 18. 04. 2009, 1♂, 24. 04. 2009, 1♀, 03. 05. 2009, 2♀, 09. 05. 2009, 1♀, Zselickisfalud, village, towards Szilvásszentmárton, 18. 04. 2009, 1♂, Gálosfa: village, 24. 04. 2009, 1♀, Zselickislak, 25. 04. 2009, 1♂, 01. 05. 2009, 2♀, 1♂, 30. 05. 2009, 1♀, Simonfa: fir forest, 25. 04. 2009, 4♀, Hajmás, 08. 05. 2009, 2♀, Bánya: lake (tópart), 24. 05. 2009, 1♀, 1♂ - Common. Hostplants: *Equisetum palustre, E. sylvaticum, E. arvense* and *E. pratense*.

Blennocampinae

Blennocampa phyllocolpa Viitasaari & Vikberg, 1985 (= *Blennocampa pusilla* (Klug, 1816)): Kaposmérő, 12. 05. 1991, 2♂, 02. 05. 1992, 2♂, Zselickislak, 25. 04. 2009, 1♀, Simonfa: fir forest, 25. 04. 2009, 1♀, Simonfa, Tótyai-dűlő, 25. 04. 2009, 1♀, 03. 05. 2009, 2♀ - Frequent. Larva rolls the leaves of *Rosa* spp.

Cladardis elongatula (Klug, 1817): Kaposmérő, Jókai str. 9., 02. 05. 1992, 2♀, 1♂ - Locally frequent. Hostplants: *Rosa* spp.

Claremontia alternipes (Klug, 1816): Kaposmérő, 10. 05. 1991, 1♀, 1♂, Cserénfa: Könyökes, 24. 04. 2009, 1♀, Simonfa, fir forest, 08. 05. 2009, 1♀ - Sporadic. Hostplant: *Rubus idaeus*.

Claremontia puncticeps (Konow, 1886): Szenna, Denna: forester's lodge (Dennai erdészház), 03. 04. 2009, 1♀ - Rather rare. Hostplant: *Sanguisorba minor*.

Claremontia tenuicornis (Klug, 1816): Kaposmérő, 02. 05. 1992, 1♀ - Rather rare. Larva on *Filipendula ulmaria* and *Alchemilla* spp.

Eutomostethus ephippium (Panzer, 1798): Kaposmérő, 15. 06. 1990, 1♀, 15. 07. 1990, 1♂, 31. 07. 1990, 1♂, 05. 05. 1991, 2♂, 10. 05. 1991, 1♀, 07. 06. 1991, 1♂, 10. 05. 1991, 2♂, 23. 06. 1991, 1♀, 1♂, 04. 07. 1991, 1♂, 25. 07. 1991, 1♂, 12. 08. 1991, 1♂, 02. 05. 1992, 1♂, Kaposvár, 14. 07. 1991, 1♀, 4♂, Kaposvár: Zaranyi forest: 19. 06. 1989, 2♀, 23. 07. 1991, 1♀, 2♂, Zselicszentpál, 18. 04. 2009, 2♂, 24. 04. 2009, 1♀, 03. 05. 2009, 1♀, 1♂, Bőszénfa: Ropoly: fishing pond (Ropoly: tó), 24. 04. 2009, 1♂, 01. 05. 2009, 1♂, Zselickislak, 24. 04. 2009, 1♀, 01. 05. 2009, 2♀, Cserénfa, Fürteleki forest (Fürteleki-erdő), 25. 04. 2009, 1♀, Bárdudvarnok: Lipótfa, 26. 04. 2009, 1♂, Szenna: Denna meadow (Dennai rét), 26. 04. 2009, 1♂, Hajmás, 08. 05. 2009, 1♂, Simonfa: fir forest, 08. 05. 2009, 2♂, 09. 05. 2009, 2♂, Szentbalázs: Herceg-képe, 15. 05. 2009, 1♂, Gyűrűfű, Kaposfő (in lit. Roller and Haris, 2008) - Common everywhere. Larva on *Graminae*.

Eutomostethus gagathinus (Klug, 1816): Gyűrűfű, 20-22. 05. 2006, 2♀, Kaposszentbenedek, 10. 05. 2009, 1♂ - Sporadic.

Eutomostethus luteiventris (Klug, 1816): Kaposmérő, 05. 04. 1992, 1♀, Gyűrűfű, 20-22. 05. 2006, 1♀, Zselickislak, 01. 05. 2009, 1♀ - Locally frequent but sporadic in the Zselic Hills. Larva on *Juncus effusus*.

Fenusa (Fenusa) dohrnii (Tischbein, 1846): Bőszénfa: Ropoly: fishing pond (Ropoly: tó), 01. 05. 2009, 1♀ - Sporadic. Hostplants: *Alnus* spp.

Fenusella nana (Klug, 1816): Kaposszentbenedek: Petörke lake on Betula (Petörkei tó partja, nyír), 12. 07. 2009, 1 larva in mine - Rare. Hostplants: *Betula pendula* and *B. pubescens*.

Halidamia affinis (Fallén, 1807): Kaposmérő, 16. 06. 1991, 1♀, 24. 05. 1992, 1♀, Zselicszentpál. 24. 04. 2009, 1♀, Bőszénfa: Ropoly: fishing pond (Ropoly: tó), 24. 04. 2009, 2♀, Szenna: Denna meadow (Dennai rét), 26.

04. 2009, 1♀, Kaposgyarmat, 01. 05. 2009, 1♀ - Frequent. Hostplants: *Galium aparine* and *G. molugo*.

Heterarthrus vagans (Fallén, 1808): Kaposmérő, 23. 06. 1991, 1♀ - Sporadic. Hostplants: *Alnus* spp.

Metallus pumilus (Klug, 1816): Kaposmérő, 24. 08. 1991, 1♀ - Sporadic. Hostplant: *Rubus fruticosus* and *R. idaeus*.

Monophadnoides rubi (Harris, 1845) (syn. *Monophadnoides geniculatus* (Hartig, 1837)): Kaposmérő, 13. 04. 1991, 1♀ - Generally frequent but rare in the Zselic Hills. Hostplants: *Filipendula ulmaria, Geum* spp. and *Rubus* spp.

Monophadnoides ruficruris (Brullé, 1832): Zselickisfalud: village, towards Szilvásszentmárton, 11. 04. 2009, 1♀ - Sporadic. Hostplant: *Rubus fructicosus*.

Monphadnus pallescens (Gmelin, 1790): Kaposmérő, 13. 04. 1991, 1♀, 26. 04. 1991, 1♀, 05. 05. 1991, 1♀, 18. 04. 1992, 1♀, 02. 05. 1992, 2♀, 16. 05. 1992, 1♀, Zselickisfalud: Enyezdi barrack, 10. 04. 2009, 1♀, Zselickisfalud, village towards Szilvásszentmárton, 18. 04. 2009, 1♀, Zselickisfalud: ferns, towards Ropoly, 24. 04. 2009, 1♀, Zselicszentpál, 11. 04. 2009, 1♀, 18. 04. 2009, 1♀, 24. 04. 2009, 2♀, 03. 05. 2009, 3♀, Bőszénfa: Ropoly: fishing pond (Ropoly: tó), 11. 04. 2009, 1♀, 24. 04. 2009, 4♀, Cserénfa: Könyökes, 24. 04. 2009, 1♀, Cserénfa, Frteleki foreast (Fürteleki-erdő), 25. 04. 2009, 1♀, Simonfa, fir forest, 25. 04. 2009, 1♀, Zselickislak, 01. 05. 2009, 3♀ - Common. Hostplants: *Ranunculus acris, R. repens, R. lanuginosus* and *Anemone nemorosa*.

Monphadnus spinolae (Klug, 1816): Kaposmérő, 12. 07. 1991, 1♀ - Sporadic. Hostplants: *Clematis vitalba* and *C. flammula*.

Paracharactus (Dicrostema) gracilicornis (Zaddach, 1859): Bárdudvarnok: Lipótfa: Cseberki forest (Cseberki-erdő), 05. 04. 2009, 1♀ - Rare. Hostplant: *Adoxa moschatellina*. New record for Hungary.

Parna tenella (Klug, 1816): Kaposmérő, Jókai str. 9., 07. 06. 1992, 1♀ - Rare. Larva makes mines in leaves of *Tilia platyphyllos* and *T.cordata x europaea*.

Periclista (Periclista) albiventris (Klug, 1816): Gyűrűfű, 20-22. 05. 2006, 2♀ - Sporadic. Hostplant unknown.

Stethomostus fuliginosus (Schrank, 1781): Kaposmérő, 07. 06. 1991, 1♂, 13. 07. 1991, 1♀, 24. 05. 1992, 1♀, Gyűrűfű, 20-22. 05. 2006, 1♂, Zselicszentpál, 18. 04. 2009, 1♀, Bőszénfa: Ropoly: fishing pond (Ropoly: tó), 24. 04. 2009, 1♀, 01. 05. 2009, 1♂ - Frequent. Larva on *Ranunculus acris, R. repens* and *R. sceleratus*.

Tenthredininae

Aglaostigma (Astochus) aucupariae (Klug, 1817): Kaposmérő, 04. 04. 1991, 1♂, 13. 04. 1991, 1♂, 10. 05. 1991, 1♀, 2♂, 12. 05. 1991, 2♀, 1♂, 05. 04. 1992, 1♀, 1♂, Szenna: Denna forester's lodge (Dennai erdészlak), 03. 04. 2009, 2♀, Zselickisfalud: Keleti Gyöngyös brook (Keleti Gyöngyös patak menti rét), 03. 04. 2009, 2♀, 1♂, Zselickisfalud: Enyezdi barrack, 03. 04. 2009, 2♀, 4♂, 10. 04. 2009, 6♂, Szenna: Denna meadow (Dennai rét), 04. 04. 2009, 1♀, 1♂, Zselickisfalud: towards Kardosfa, agr. field (Kardosfa felé, táblaszegély), 04. 04. 2009, 1♂, Szenna: village, 04. 04. 2009, 1♂, Bárdudvarnok: Lipótfa: Cseberki forest (Cseberki erdő), 05. 04. 2009, 1♂, Bánya: lake (tópart), 05. 04. 2009, 1♂, Kaposszentbenedek, 10. 04. 2009, 1♀, 1♂, Kaposgyarmat: olda railway (régi vasút), 10. 04. 2009, 2♀, 1♂, Bőszénfa: Ropoly: fihing pond (tó), 11. 04. 2009, 1♀, 1♂, Kaposszerdahely, 12. 04. 2009, 1♀, Cserénfa: Irafai forest (Irafai-erdő), 12. 04. 2009, 1♂, Gálosfa: village, 24. 04. 2009, 1♂, Simonfa and Bőszénfa (in lit. Roller and Haris, 2008) - Common. Larva on *Galium mollugo* and *G. boreale*.

Aglaostigma (Astochus) fulvipes (Scopoli, 1763): Kaposmérő, 05. 05. 1990, 1♀, 13. 04. 1991, 1♂, 05. 05. 1991, 1♂, 10. 05. 1991, 1♀, 12. 05. 1991, 1♀, Kaposfő, 19. 06. 1991, 1♀, 02. 05. 1992, 1♂,

Zselickisfalud, meadow towards Szilvásszentmárton, 11. 04. 2009, 1♀, , 18. 04. 2009, 1♀, Gálosfa: village, 12. 04. 2009, 3♀, 1♂, Zselickisfalud: Enyezdi barrack, 08. 05. 2009, 1♂, Bőszénfa: Ropoly, meadow (rét), 18. 04. 2009, 1♀, Bőszénfa: Ropoly, fishing pond (tópart), 18. 04. 2009, 1♂, Kaposszentbenedek, 19. 04. 2009, 1♂, 26. 04. 2009, 1♂, Zselicszentpál, 24. 04. 2009, 3♀, 1♂, 03. 05. 2009, 1♂, Simonfa: Tótyai-dűlő, 24. 04. 2009, 3♀, Zselickislak, 25. 04. 2009, 2♀, 3♂, 01. 05. 2009, 1♂, Zselickislak: Borgyan, 21. 04. 2007, 1♂, Simonfa, fir forest, 25. 04. 2009, 1♂, Bárdudvarnok: Lipótfa, forest at Kadarkút road, 26. 04. 2009, 3♂, Szenna: village, meadow towards Kaposvár, 26. 04. 2009, 1♀, 1♂ - Common. Larva on *Galium mollugo* and *G. verum*.

Macrophya (Macrophya) albicincta (Schrank, 1776): Kaposmérő, 06. 05. 1991, 1♀, 07. 05. 1991, 1♀, 10. 05. 1991, 4♀, 1♂, 12. 05. 1991, 2♂, 15. 06. 1991, 1♀, 02. 05. 1992, 1♀, 24. 05. 1992, 2♀, Cserénfa: Nádasdi forest (Nádasdi erdő), 29. 05. 1991, 3♀, Cserénfa: Irafai forest (Irafai-erdő), 12. 04. 2009, 1♂, Zselicszentpál, 18. 04. 2009, 2♀, 24. 04. 2009, 3♀, 3♂, 03. 05. 2009, 5♀, 09. 05. 2009, 2♀, Bőszénfa: Ropoly, fishing pond (tó), 18. 04. 2009, 2♀, 2♂, 24. 04. 2009, 1♀, 3♂, 01. 05. 2009, 1♀, Zselickislak, 25. 04. 2009, 1♀, 1♂, 01. 05. 2009, 4♀, 2♂, 08. 05. 2009, 1♀, 1♂, 05. 05. 2009, 1♀, 23. 05. 2009, 1♀, Cserénfa, Fürteleki forest (Fürteleki-erdő), 25. 04. 2009, 1♂, Simonfa, fir forest (fenyves), 25. 04. 2009, 1♀, 03. 05. 2009, 1♀, 08. 05. 2009, 2♀, 09. 05. 2009, 1♂, Kaposszentbenedek, 26. 04. 2009, 2♀, Szenna: Denna meadow (Dennai-rét), 26. 04. 2009, 2♀, 1♂, Zselickisfalud, ferns, towards Ropoly (páfrányos, Ropoly felé), 01. 05. 2009, 1♀, Hajmás, 08. 05. 2009, 1♂ - Common. Hostplants: *Sambucus ebulus, S. nigra, S. racemosa, Valeriana officinalis* and *Viburnum opalus*.

Macrophya (Macrophya) annulata (Geoffroy, 1785): Kaposmérő, 31. 05. 1991, 1♂, 07. 06. 1991, 4♀, 1♂, 24. 05. 1992, 1♀, Zselickislak, 23. 05. 2009, 3♂, 20. 06. 2009, 1♀, Sántos, 23. 05. 2009, 1♂, Bánya, lake (tópart), 24. 05. 2009, 1♂. Gödre, Gyűrűfű (in lit. Roller and Haris, 2008) - Frequent. Larva on *Potentilla reptans, Origanum vulgare, Euphorbia, Rosa, Rubus* and *Sambucus* spp.

Macrophya (Macrophya) blanda (Fabricius, 1775): Terecsény, 09. 05. 2009, 1♂, Szentbalázs: Herceg-képe, 15. 05. 2009, 1♀, 6♂, Kaposszentbenedek, 10. 05. 2009, 3♂, Szenna: Denna meadow (Dennai-rét), 16. 05. 2009, 1♀ - Frequent. Hostplant unknown.

Macrophya (Macrophya) chrysura (Klug, 1817): Simonfa (in litt.: Roller and Haris, 2008) - Sporadic. Hostplant *Daucus carota*.

Macrophya (Macrophya) crassula (Klug, 1817): Kaposmérő, 24. 05. 1992, 1♀, 07. 06. 1992, 1♀, Kaposvár, young fir plantation at road 67 (fiatal fenyves a 67-es útnál), 09. 05. 2009, 2♂, Szenna: Denna meadow (Dennai-rét), 16. 05. 2009, 1♀ - Sporadic. Hostplant: *Sambucus ebulus*.

Macrophya (Macrophya) duodecimpunctata (Linné, 1758): Kaposmérő, 05. 05. 1990, 1♀, 26. 04. 1991, 1♀, 31. 05. 1991, 1♀, 07. 06. 1991, 2♀, 02. 05. 1992, 1♀, 16. 05. 1992, 2♀, 1♂, 24. 05. 1992, 2♀, 07. 06. 1992, 1♀, Kaposgyarmat, 15. 05. 2009, 1♀, Zselickislak, 25. 04. 2009, 1♂, 01. 05. 2009, 3♂, 30. 05. 2009, 2♀, Zselicszentpál, 03. 05. 2009, 1♂, Szentbalázs: Herceg-képe, 15. 05. 2009, 1♂, Bárdudvarnok: Lipótfa, forest at Kadarkút road (erdő a kadarkúti útelágazásnál), 16. 05. 2009, 1♂, Szenna: Denna meadow (Dennai-rét), 24. 05. 2009, 1♀, Gyűrűfű (in lit. Roller and Haris, 2008) - Common. Hostplants: *Graminae, Cyperaceae* and *Carex* spp.

Macrophya (Macrophya) erythrocnema A. Costa, 1859: Kaposmérő, 05. 05. 1991, 1♀, 10. 05. 1991, 1♀, Kaposgyarmat, 15. 05. 2009, 1♂, Kaposszentbenedek, 26. 04. 2009, 1♀ - Sporadic. Hostplant: *Knautia arvensis*.

Macrophya (Macrophya) militaris (Klug, 1817): Kaposmérő, 23. 06. 1991, 3♀, 13. 07. 1991, 1♀, 23. 06. 1992, 1♀, 27. 06. 1992, 1♀, 28. 06. 1992, 1♀ - Sporadic. Hostplant: *Rubus caesius*.

Macrophya (Macrophya) montana (Scopoli, 1763): Kaposmérő, 15. 06. 1991, 2♀, 23. 06. 1991, 2♀, 26. 06. 1991, 1♀, 29. 06. 1991, 1♀, 2♂, Zselickisfalud: Kardosfa, towards Millenium Memory Linden Forest (Milleniumi Emlékhársas felé), 02. 05. 2009, 4♀, 1♂, 10. 05. 2009, 2♀, 2♂, 30. 05. 2009, 1♀,

Simonfa, fir forest (fenyves), 08. 05. 2009, 1♂, Kaposvár, young fir plantation at road 67 (67-es út, fiatal fenyves), 09. 05. 2009, 1♀, Zselickislak, 15. 05. 2009, 1♀, 23. 05. 2009, 2♀, 2♂, 30. 05. 2009, 1♂, 06. 06. 2009, 1♀, Szentbalázs: Herceg-képe, 15. 05. 2009, 1♀, Kaposgyarmat, 15. 05. 2009, 1♂, Bárdudvarnok: Lipótfa, forest at Kadarkút road (erdő a kadarkúti leágazásnál), 16. 05. 2009, 1♀, Sántos, 23. 05. 2009, 1♀, 1♂, 06. 06. 2009, 2♀, 3♂, Szenna: Denna meadow (Dennai-rét), 30. 05. 2009, 1♀, 1♂, Gyűrűfű, Cserénfa (in lit. Roller and Haris, 2008) - Common. Hostplant: *Rubus caesius*.

Macrophya (Macrophya) postica (Brullé, 1832): Kaposmérő, 31. 07. 1990, 1♀, 25. 06. 1991, 1♀, 24. 05. 1992, 1♀, 07. 06. 1992, 1♀, 15. 06. 1992, 3♂, Zselickislak, 23. 05. 2009, 1♂, 06. 06. 2009, 1♂, Szenna, village towards Kaposvár, 24. 05. 2009, 1♀, Sántos, 06. 06. 2009, 1♀ - Frequent. Hostplant unknown.

Macrophya (Macrophya) recognata Zombori, 1979: Kaposmérő, 05. 05. 1991, 1♀, 31. 05. 1991, 1♀, 31. 07. 1991, 1♀, 10. 05. 1992, 1♀, 2♂, 02. 05. 1992, 1♀, 07. 06. 1992, 1♀, 04. 08. 1992, 1♂, Kaposvár: Zaranyi forest (Zaranyi-erdő), 23. 07. 1991, 1♀, 4♂, Szenna: Denna meadow (Dennai-rét), 26. 04. 2009, 1♂, 16. 05. 2009, 1♀, Zselicszentpál, 09. 05. 2009, 1♀ - Frequent. Hostplant unknown.

Macrophya (Macrophya) ribis (Schrank, 1781): Kaposmérő, 31. 07. 1990, 2♀, 3♂, 14. 07. 1991, 1♀, 1♂, 19. 07. 1991, 1♀, 31. 07. 1991, 1♀, 01. 08. 1991, 1♀, 17. 06. 1992, 1♀ - Frequent. Larva on *Sambucus nigra*.

Macrophya (Macrophya) rufipes (Linné, 1758): Kaposvár, 09. 10. 1989, 1♀, Kaposvár: Zaranyi forest (Zaranyi-erdő), 23. 07. 1991, 1♀, 1♂, Zselickislak, 12. 07. 2009, 1♀ - Sporadic. Larva on *Agrimonia eupatoria* and *Vitis vinifera*.

Macrophya (Macrophya) sanguinolenta (Gmelin, 1790): Kaposmérő, 15. 06. 1991, 1♀, 02. 05. 1992, 1♀, Kaposgyarmat, 01. 05. 2009, 1♀ - Sporadic. Larva on *Galeopsis* spp., *Senecio* spp. and *Veronica* spp.

Macrophya (Macrophya) tenella Mocsáry, 1881: Zselickislak, 01. 05. 2009, 1♂, Szenna: Denna meadow (Dennai-rét), 16. 05. 2009, 1♀ - Rare. Hostplant: *Geranium* spp.

Pachyprotasis antennata (Klug, 1817): Kaposmérő, 07. 06. 1992, 1♀, 23. 06. 1992, 1♀ - Sporadic. Larva on *Filipendula ulmaria* and *Fraxinus* spp.

Pachyprotasis rapae (Linné, 1767): Kaposmérő, 28. 07. 1990, 1♀, 10 08. 1990, 2♀, 24. 08. 1991, 1♀, 12. 05. 1991, 1♀, Bőszénfa, 26. 06. 1991, 1♀, Cserénfa: Nádasdi forest (Nádasdi-erdő), 29. 05. 1991, 1♀, Zselicszentpál, 18. 04. 2009, 1♂, 24. 04. 2009, 1♀, Bőszénfa: Ropoly, meadow (rét), 18. 04. 2009, 1♂, Bőszénfa: Ropoly, fishing pond (tó), 18. 04. 2009, 1♂, 01. 05. 2009, 1♀, Gálosfa: village, 24. 04. 2009, 2♀, Cserénfa, Fürteleki forest (Fürteleki-erdő), 25. 04. 2009, 1♀, Zselickislak, 08. 05. 2009, 1♀, 15. 05. 2009, 1♀, 23. 05. 2009, 1♀, Zselickisfalud, ferns towards Ropoly (páfrányos), 09. 05. 2009, 1♀, Cserénfa, forestry road North to the village (falutól északra erdei út), 23. 05. 2009, 1♂, Szenna: Denna meadow (Dennai-rét), 24. 05. 2009, 1♀, Gyűrűfű (in lit. Roller and Haris, 2008) - Common. Hostplants: *Solanum tuberosum, Pedicularis palustris, Angelica sylvestris, Veronica beccabunga, Betonica officinalis, Corylus avellana, Salix caprea, Fraxinus excelsior, Tussilago farfara, Symphoricarpos albus, Scrophularia, Solidago, Verbascum, Origanum, Atropa, Sarothamnus, Senecio, Polygonum, Aspidium, Epilobium, Hypericum, Galeopsis, Mentha, Polystichum, Plantago, Quercus* and *Stachys* spp.

Rhogogaster (Cytisogaster) picta (Klug, 1817): Kaposvár (in litt. Roller and Haris, 2008), Kaposgyarmat, 15. 05. 2009, 1♀ - Sporadic. *Cytisus scoparius, C. nigricans, Genista germanica* and *G. tinctoria*.

Rhogogaster (Rhogogaster) chlorosoma (Benson, 1943): Kaposmérő, 19. 07. 1991, 1♀, 31. 07. 1991, 1♀, 24. 05. 1992, 1♀, 23. 06. 1992, 1♂, Gödre, 17. 06. 2006, 1♀, Zselickislak, 08. 05. 2009, 1♂, 23. 05. 2009, 1♂, Szenna: Denna meadow, (Dennai-rét), 24. 05. 2009, 1♀, 30. 05. 2009, 3♂ - Frequent.

Hostplants: *Pteridium aquilinum, Alnus glutinosa, Circaea, Prunus* spp., *Ranunculus* spp., *Rosa* spp., *Salix* alba, *S. purpurea, Stellaria* spp., *Filipendula ulmaria*, *Populus tremula, Padus* spp., *Betula* spp., *Corylus avellana* and *Sorbus* spp.

Rhogogaster (Rhogogaster) viridis (Linné, 1758): Kaposmérő, 24. 05. 1992, 1♀, Zselicszentpál, 24. 04. 2009, 1♂, Gyűrűfű (in lit. Roller and Haris) - Frequent. *Chamnaerion angustifolium, Salix* spp., *Populus* spp., *Alnus* spp., *Quercus* spp., *Filipendula* spp., *Stellaria* spp. and *Circaea* spp.

Sciapteryx consobrina (Klug, 1816): Kaposmérő, 13. 04. 1991, 1♂, 02. 05. 1992, 2♀, 05. 04. 1992, 1♀, Kaposszentbenedek, 05. 04. 2009, 3♀, 1♂, 10. 04. 2009, 3♀, 19. 04. 2009, 1♀, 1♂, Bárdudvarnok: Lipótfa: Cseberki forest (Cseberki-erdő), 05. 04. 2009, 3♀, 2♂, Kaposgyarmat: old railway (régi vasút), 10. 04. 2009, 1♂, Bőszénfa: Ropoly, fishing pond (tó), 11. 04. 2009, 2♀, 24. 04. 2009, 3♀, 1♂, 10. 05. 2009, 2♀, 2♂, Zselicszentpál, 18. 04. 2009, 2♀, Cserénfa: Irafai forest (Irafai-erdő), 24. 04. 2009, 1♀, Cserénfa, Fürteleki forest (Fürteleki-erdő), 25. 04. 2009, 1♀, Szenna: Denna meadow (Dennai-rét), 26. 04. 2009, 1♀, Simonfa, fir forest (fenyves), 03. 05. 2009, 2♀, Kaposfő, Bőszénfa, Bárdudvarnok (in lit. ROLLER and HARIS 2008) - Common. Larval hosts: *Adoxa* spp., *Anemone* spp. and *Ranunculus ficaria*.

Sciapteryx costalis (Fabricius, 1775): Kaposmérő, 13. 04. 1991, 1♀, 26. 04. 1991, 1♀, 3♂, 05. 04. 1992, 1♀, 25. 04. 1992, 2♂, Kaposújlak, 26. 04. 1991, 1♂, Zselickisfalud: Keleti Gyöngyös brook, meadow (Keleti Gyöngyös-patak, rét), 03. 04. 2009, 1♂, Zselickisfalud, agr. field (táblaszegély), 04. 04. 2009, 2♂, Szenna, village towards Kaposvár (falu végén, rét), 12. 04. 2009, 2♀ - Frequent. Hostplant: *Ranunculuis acris*.

Tenthredo (Zonuledo) amoena Gravenhorst, 1807: Kaposmérő, 10. 08. 1990, 1♀ - Sporadic. Hostplants: *Hypericum perforatum* and *H. maculatum*.

Tenthredo (Tenthredella) atra Linné, 1758: Kaposmérő, 10. 05. 1991, 1♀, Gyűrűfű, 21. 05. 2006, 1♀, Bőszénfa: Ropoly, (meadow) rét, 18. 04. 2009, 1♀, Bőszénfa: Ropoly, (fishing pond) tópart, 24. 04. 2009, 1♀, Szenna: (Denna meadow) Dennai-rét, 26. 04. 2009, 1♀, 16. 05. 2009, 1♀, Zselickislak, 25. 04. 2009, 1♂, 01. 05. 2009, 5♀, 2♂, 08. 05. 2009, 1♂, 15. 05. 2009, 2♀, 23. 05. 2009, 3♀, Zselicszentpál, 03. 05. 2009, 2♀, 09. 05. 2009, 3♀ - Frequent. Larval hosts: *Lamium, Mentha, Plantago, Vicia, Ranunculus, Scabiosa, Brassica* and *Solanum* spp.

Tenthredo (Cephaledo) bifasciata rossii (Panzer, 1804): Kaposmérő, 22. 07. 1990, 1♀, 04. 08. 1990, 1♀, 19. 07. 1991, 1♀, 25. 07. 1991, 1♂, 31. 07. 1991, 2♀, 01. 08. 1991, 1♂, 09. 08. 1991, 3♀, 12. 08. 1991, 1♀, Kaposvár: Zaranyi forest (Zaranyi-erdő), 23. 07. 1991, 1♀, Kaposgyarmat, 18. 07. 2009, 1♀, 1♂ - Frequent. Hostplants: *Scrophularia* and *Verbascum* spp.

Tenthredo (Cephaledo) bifasciata violacea (Ed. André, 1881): Gödrekeresztúr, village (belterület), 17. 06. 2006, 1♂, Kaposgyarmat, 18. 07. 2009, 1♀, Zselickislak, 12. 07. 2009, 1♀, 30. 05. 2009, 1♂, Kaposszentbenedek, 12. 07. 2009, 1♀, Szenna: (Denna meadow) Dennai-rét, 24. 05. 2009, 1♀, Szenna, village towards Kaposvár, pasture, 24. 05. 2009, 1♀, Hajmás, 08. 05. 2009, 1♀ - Frequent. Hostplant unknown.

Tenthredo (Endotethryx) campestris Linné, 1758: Kaposmérő, 31. 07. 1990, 1♀, 15. 06. 1991, 1♀, 31. 07. 1991, 1♀, 09. 08. 1991, 2♀, 1♂, Kaposvár: Szabadság-park, 17. 06. 1987, 1♀, Zselickislak, 01. 05. 2009, 1♂, 08. 05. 2009, 1♂, 15. 05. 2009, 2♂, 23. 05. 2009, 1♀, 1♂, Sántos, 23. 05. 2009, 1♀, 1♂, Szentbalázs: Herceg-képe, 15. 05. 2009, 1♂, Szenna: Denna meadow (Dennai-rét), 24. 05. 2009, 1♂ - Frequent. Hostplant: *Aegopodium podagraria*.

Tenthredo (Zonuledo) distinguenda (Stein, 1885): Kaposszentbenedek, 26. 04. 2009, 1♀, Bőszénfa: Ropoly, fishing pond (tó), 01. 05. 2009, 1♀, Szenna: Denna meadow (Dennai-rét), 24. 05. 2009, 1♂, Zselickislak, 08. 05. 2009, 1♀, Gyűrűfű (in lit. Roller and Haris, 2008) - Sporadic. Hostplant unknown.

Tenthredo (Cephaledo) excellens (Konow, 1886): Kaposmérő, 15. 06. 1991, 1♀, 07. 06. 1992, 1♀, Zselickislak, 30. 05. 2009, 1♀ - Sporadic. Hostplant unknown.

Tenthredo (Tenthredella) livida Linné, 1758: Kaposfő (in litt. ROLLER and HARIS 2008) - Frequent, but rare in the Zselicség. Hostplants: *Epilobium* spp., *Rosa* spp., *Sorbus aucuparia, Salix* spp., *Corylus avellana, Corpinus betulus, Plantago* spp., *Fraxinus excelsior, Viburnum album, Lonicera* spp., *Symphoricarpus alba, Arctium* spp., *Lamium album, Melissa officinalis, Pteridium aquilinum* and *Athyrium filix-femina*.

Tenthredo (Tenthredo) marginella Fabricius, 1793: Kaposmérő, 12. 08. 1991, 1♀, 26. 08. 1991, 1♀ - Sporadic. Hostplants: *Mentha* and *Ocimum* spp.

Tenthredo (Eurogaster) mesomela Linné, 1758: Cserénfa: Nádasdi forest (Nádasdi erdő), 29. 05. 1991, 1♀, Kaposvár: Zaranyi forest (Zaranyi erdő), 19. 06. 1989, 1♀, Bőszénfa, 26. 06. 1991, 4♀, Kaposmérő, 02. 05. 1992, 1♀, Bőszénfa: Ropoly, fishing pond (tópart), 01. 05. 2009, 1♂, Sántos, 23. 05. 2009, 1♀, 06. 06. 2009, 2♀ - Frequent. Larval hosts: *Polygonum persicaria, Arctium lappa, Heracleum* spp., *Ranunculus* spp., *Epilobium* spp., *Rumex* spp, *Salix* spp., *Veronica* sp., *Tussilago* spp., *Petasites* sp., *Senecio* sp., *Solidago* sp., and *Stachys* spp.

Tenthredo (Tenthredo) notha Klug, 1817: Kaposmérő, 10. 08. 1990, 1♀, 11. 08. 1990, 1♀, 12. 08. 1990, 1♀, 20. 08. 1990, 1♂, 01. 08. 1991, 1♀, 24. 08. 1991, 1♀, Gálosfa: Vörösalma pond (tó a vadászháznál), 10. 08. 2009, 4♀, 1♂, 15. 08. 2009, 3♂, Bőszénfa: Ropoly, 15. 08. 2009, 1♀ - Frequent. Larva on *Trifolium repens*, *T. pretense* and *Vicia cracca*.

Tenthredo (Tenthredo) omissa (Förster, 1844): Kaposmérő, 19. 07. 1990, 1♀, 28. 07. 1990, 1♀, 10. 08. 1990, 1♀, 11. 08. 1990, 1♀, 1♂, 15. 08. 1990, 1♂, 01. 08. 1991, 1♀, Kaposvár (in lit. Roller and Haris, 2008) - Frequent. Hostplants: *Plantago media* and *P. lanceolata*.

Tenthredo (Tenthredo) scrophulariae Linné, 1758: Kaposmérő, 07. 06. 1992, 2♀, Szenna (In lit. ROLLER and HARIS 2008) - Sporadic. Larva on *Scrophularia* and *Verbascum* spp.

Tenthredo (Tenthredella) solitaria Scopoli, 1763: Gyűrűfű, 21. 05. 2006, 4♀, 1♂ - Montane species, sporadic in Hungary. Larva on *Euphorbia cyparissius*.

Tenthredo (Temuledo) temula Scopoli, 1763: Kaposvár: Zaranyi forest (Zaranyi-erdő), 15. 05. 1987, 1♀, Kaposmérő, 02. 05. 1992, 1♂, 15. 06. 1992, 1♀, Zselickisfalud: Pölöske meadow (Pölöske rét), 13. 05. 1997, 1♀, Zselickislak, 25. 04. 2009, 1♀, 01. 05. 2009, 2♂, 15. 05. 2009, 2♀, 3♂, 23. 05. 2009, 1♂, 30. 05. 2009, 1♂, Zselicszentpál, 03. 05. 2009, 2♀, 4♂, 09. 05. 2009, 1♀, 2♂, Szentbalázs: Herceg-képe, 15. 05. 2009, 1♂, Kaposgyarmat, 05. 05. 2009, 2♀, Szenna: Denna meadow (Dennai-rét), 16. 05. 2009, 1♂, 24. 05. 2009, 1♀, Hajmás, 23. 05. 2009, 1♀, Sántos, 23. 05. 2009, 1♀, 1♂, Szenna: meadow towards Kaposvár (falu végén rét), 24. 05. 2009, 1♂, Kaposfő (in lit. Roller and Haris, 2008) - Common. Larva on *Ligustrum* and *Origanum* spp.

Tenthredo (Tenthredo) thompsoni (Curtis, 1839): Kaposmérő, 24. 08. 1990, 1♂, 09. 08. 1991, 1♀, 10. 08. 1991, 1♀, 1♂, 12. 08. 1991, 1♀, 31. 08. 1991, 1♀, Kaposvár: Toponár: built in area (belterület): 27. 08. 1996, 1♀, Lad, 18. 08. 1990, 1♀, Kaposszentbenedek, 09. 08. 2009, 2♀ - Frequent. Hostplant: *Pimpinella major*.

Tenthredo (Tenthredo) vespa Retzius, 1783: Kaposmérő, 31. 07. 1990, 1♂, 04. 08. 1990, 1♀, 10. 08. 1990, 2♂, 11. 08. 1990, 3♀, 20. 08. 1990, 1♂, 09. 08. 1991, 2♀, 3♂, 12. 08. 1991, 1♀, 1♂, Kaposvár: Zaranyi forest (Zaranyi-erdő): 19. 06. 1♀, 1♂, Kaposszentbenedek, 09. 08. 2009, 1♀, Simonfa: fir forest (fenyves), 09. 08. 2009, 2♂, Zselickisfalud: Kardosfa, 15. 08. 2009, 1♀ - Frequent. Hostplants: *Lonicera caprifolium, Syringa vulgaris, Viburnum opulus, Fraxinus excelsior, Jasminum officinale, Rosa, Spiraea, Acer platanoides, Ligustrum vulgare, Symphoricarpos albus, S. alba*.

Tenthredo (Maculedo) vespiformis Schrank, 1781: Kaposgyarmat, 15. 05. 2009, 1♂ - Rare in Hungary. Hostplant unknown.

Tenthredo (Zonuledo) zonula Klug, 1817: Gyűrűfű, 21. 05. 2006, 1♂, Zselickisfalud: towards Millenium Memory Linden Forest (Milleniumi Emlékhársas felé), 02. 05. 2009, 2♀, Kaposvár, young fir plantation at road 67 (fenyves a 67-es út oldalán), 09. 05. 2009, 1♂, Szenna: Denna meadow (Dennai-rét), 24. 05. 2009, 1♀, Gödre (in lit. Roller and Haris, 2008) - Frequent. Hostplant: *Hypericum perforatum*.

Tenthredopsis friesei (Konow, 1884): Kaposmérő, 16. 05. 1992, 2♀, 24. 05. 1992, 1♀, Gyűrűfű, 21. 05. 2006, 2♀, Szentbalázs: Herceg-képe, 15. 05. 2009, 1♂, Zselicszentpál, 16. 05. 2009, 1♂, Zselickislak, 23. 05. 2009, 1♀, 3♂, 30. 05. 2009, 2♀, Cserénfa: Nádasdi forest (Nádasdi-erdő), 29. 05. 1991, 1♀, Hajmás, 23. 05. 2009, 1♀- Frequent. Hostplants: *Holcus mollis* and other *Graminae*.

*Tenthredopsis lactiflua (*Klug, 1817): Kaposmérő, 26. 04. 1991, 1♀, Kaposszentbenedek, 26. 04. 2009, 2♀ - Sporadic. Hostplant unknown.

Tenthredopsis litterata (Geoffroy, 1785): Gyűrűfű, 21. 05. 2006, 1♀, Kaposvár: Zaranyi forest (Zaranyi-erdő), 19. 05. 1989, 1♀, Kaposmérő, 31. 05. 1991, 1♂, Zselickislak, 23. 05. 20009, 2♀, 30. 05. 2009, 1♀, Simonfa, fir forest (fenyves), 08. 05. 2009, 1♀ - Frequent. Larva on *Agrostis, Dactylis* and *Calamagrostis* spp.

Tenthredopsis nassata (Linné, 1767): Kaposmérő, 31. 05. 1991, 1♀, 23. 06. 1991, 1♂, 16. 05. 1992, 1♀, 1♂, 24. 05. 1992, 1♀, 24. 05. 1992, 1♀, 07. 06. 1992, 1♀, Kaposvár: Zaranyi forest (Zaranyi erdő), 19. 06. 1989, 1♀, Gyűrűfű, 21. 05. 2009, 1♀, Sántos, 23. 05. 2009, 2♀, Hajmás, 23. 05. 2009, 1♀, Zselickislak, 23. 05. 2009, 2♀, 30. 05. 2009, 1♀, Bőszénfa: Ropoly, fishing pond (tó), 08. 05. 2009, 1♀ - Frequent. Hostplants: *Dactylis glomerata, Deschampsia cespitosa, D. calmagrostis, Flexuosa* spp., *Holcus* spp., *Lolium perenne, Agropyron* spp., *Carex* spp., *Anthriscus silvestris* and *Artemisia* spp.

Tenthredopsis ornata (Serville, 1823) (syn. *Tenthredopsis excisa* (C. G. Thomson, 1870)): Kaposgyarmat, 01. 05. 2009, 1♂, 15. 05. 2009. 1♀ - Sporadic. Larva on *Brachypodium sylvaticum*.

Tenthredopsis scutellaris (Fabricius, 1804): Zselickislak, 06. 06. 2009, 1♀, Gyűrűfű, 21. 05. 2006, 1♀ - Sporadic. Larva on *Poa pratense, Festuca elatior, Dactylis glomerata* and *Elytrigia repens*.

Tenthredopsis sordida (Klug, 1817): Kaposmérő, 28. 04. 1991, 1♂, 10. 05. 1991, 1♀, 1♂, 12. 05. 1991, 1♀, 07. 06. 1992, 1♂, 15. 06. 1992, 1♂, Zselickislak, 25. 04. 2009, 2♂, 01. 05. 2009, 1♀, 2♂, 08. 05. 2009, 2♀, 15. 05. 2009, 1♀, 23. 05. 2009, 1♀, 06. 06. 2009, 1♂, Zselickisfalud: Enyezdi barrack, 08. 05. 2009, 2♂, Kaposgyarmat, 15. 05. 2009, 1♀, Zselicszentpál, 6. 05. 2009, 2♀, Gyűrűfű (in lit. ROLLER and HARIS 2008) - Frequent. Larva on *Arrhenatherum elatius, Lolium perene, Carex* spp., *Calamagrostis* sp. and *Dactylis glomerata*.

Tenthredopsis stigma (Fabricius, 1798): Kaposmérő, 26. 04. 1991, 1♂, 28. 04. 1991, 1♀, 05. 05. 1991, 1♀, 1♂, Simonfa: Bagó hill (Bagó-hegy), 09. 05. 1987, 1♀, Simonfa, Tótyai-dűlő. 25. 04. 2009, ♀, Szenna, meadow towards Kaposvár, 24. 05. 2009, 1♀, Gyűrűfű (in lit. ROLLER and HARIS 2008) - Frequent. Hostplant: *Triticum intermedium.*

Tenthredopsis tessellata (Klug, 1817): Kaposmérő, 02. 05. 1992, 1♀, 10. 05. 1991, 1♀ - Sporadic. Larva on *Deschampsia, Dactylis, Aira* and *Lolium* spp.

Nematinae

Euura (Euura) atra (Jurine, 1807): Kaposmérő, 02. 05. 1992, 2♀, 16. 05. 1992, 1♀, 24. 05. 1992, 1♀, Zselickisfalud: towards Szilvásszentmárton, 11. 04. 2009, 1♀ - Frequent. *Salix* spp.

Cladius (Cladius) pectinicornis (Geoffroy, 1785): Kaposvár: Zaranyi forest (Zaranyi-erdő), 23. 07. 1991, 1♀, Zselicszentpál, 24. 04. 2009, 1♀, 09. 05. 2009, 1♀ - Frequent. Larval hosts: *Fragaria, Rosa, Filipendula* spp., P*oterium sanguisorba, Lamiastrum galeobdolon* and *Comarum palustre*.

Cladius (Priophorus) brullei (Dahlbom, 1835): Kaposmérő, 15. 06. 1992, 1♀ - Frequent. Larva on *Rubus* spp.

Craesus alniastri (Scharfenberg, 1805) syn.: (*Craesus varus* (Villaret, 1832)): Kaposmérő, 27. 06. 1992, 1♀ - Sporadic. Larva on *Alnus* spp.

Endelomya aethiops (Fabricius, 1781): Szenna: Denna meadow (Dennai-rét), 26. 04. 2009, 1♀, Zseliskislak, 01. 05. 2009, 1♀ - Sporadic. Larva on *Rosa* spp.

Hoplocampa fulvicornis (Panzer, 1801) (syn.: *Hoplocampa rutilicornis* (Klug, 1816)): Zselickisfalud: Enyezdi barrack, 03. 04. 2009, 1♀, 10. 04. 2009, 1♀, Szenna: Dednna meadow (Dennai-rét), 10. 04. 2009, 1♀ - Sporadic. Larva on *Prunus spinosa*.

Hoplocampa minuta (Christ, 1791): Kaposmérő, 16. 04. 1991, 1♀ - Frequent. Larva on *Prunus domestica*, *P. armeniaca, P. instita, P. avium* and *P. spinosa*.

Mesoneura opaca (Fabricius, 1775): Zselickisfalud, towards Ropoly 2 km from road 67 (ropolyi út, 2 km a 67-es úttól), 11. 04. 2009, 1♀ - Sporadic. Larva on *Quercus robur.*

Nematinus luteus (Panzer, 1804): Kaposmérő, 27. 06. 1992, 1♀, 28. 06. 1992, 1♀ - Sporadic. Larva on *Alnus* spp.

Nematinus steini Blank, 1998: Bőszénfa: Ropoly, fishing pond (tó), 01. 05. 2009, 1♀, 1♂ - Sporadic. Larva on *Alnus* spp.

Nematus (Pteronidea) bergmanni Dahlbom, 1835: Kaposmérő, 19. 07. 1991, 2♀, 1♂, 16. 05. 1992, 1♀ - Frequent. Hostplant: *Salix*.

Nematus (Pteronidea) bipartitus Serville, 1823: Kaposmérő, 06. 07. 1991, 1♀ - Sporadic. Larva on *Salix viminalis* and *S. repens,* occasionally on *Populus* spp.

Nematus (Nematus) lucidus (Panzer, 1801): Szenna: Denna meadow (Dennai-rét), 26. 04. 2009, 1♀ - Sporadic, locally frequent. Larva on *Crataegus* and *Prunus spinosa*.

Nematus (Pteronidea) melanaspis Hartig, 1840: Kaposmérő, 25. 07. 1991, 1♀ - Sporadic. Hostplants: *Salix, Populus* and *Betula* spp.

Nematus (Pteronidea) myosotidis (Fabricius, 1804): Kaposmérő, 16. 05. 1992, 1♀, Zselicszentpál, 18. 04. 2009, 1♀, 24. 04. 2009, 1♂, Bőszénfa: Ropoly, fishing pond (tó), 18. 04. 2009, 1♂, Gálosfa: village meadow (belterületi rét), 24. 04. 2009, 1♂, Zselickislak, 01. 05. 2009, 1♀, Zselickisfalud: towards Ropoly 4 km from road 67 (ropolyi erdei út, 4 km a 67-es úttól), 08. 05. 2009, 1♂, Gyűrűfű (in lit. ROLLER and HARIS 2008) - Common. Larval hosts: *Onobrychis* and *Trifolium* spp.

Nematus (Pteronidea) oligospilus Förster, 1854: Kaposmérő, 25. 07. 1991, 1♀, 22. 07. 1990, 1♀ - Frequent. Hostplants: *Salix* spp.

Nematus (Pteronidea) silvestris Cameron, 1884: Kaposmérő, 27. 06. 1992, 1♀ - Sporadic. Hostplant: *Salix pentandra*.

Nematus (Pteronidea) tibialis Newman, 1837: Kaposmérő, 21. 07. 1991, 1♀, Kaposszentbenedek, 10. 05. 2009, 1♀, Kaposvár (in lit. Roller and Haris, 2008) - Frequent. Larva on *Robinia pseudacacia*.

Pachynematus (Polynematus) annulatus (Gimmerthal, 1834): Zselickislak, 01. 05. 2009, 1♀ - Sporadic. Larva on *Rumex* spp.

Pachynematus (Pachynematus) clitellatus (Serville, 1823): Kaposmérő, 30. 04. 1990, 1♀ (ex larva), Zselicszentpál, 24. 04. 2009, 1♀ - Frequent. Larval hosts: *Graminae, Carex* and *Juncus* spp.

Pachynematus (Pachynematus) fallax (Serville, 1823) (syn.: Pachynematus xanthocarpus (Hartig, 1840)): Kaposmérő, 26. 04. 1991, 1♀ - Frequent. Larva on *Graminae*.

Phyllocolpa leucaspis (Tischbein, 1846): Simonfa, forestry road towards Kaposgyarmat, 03. 05. 2009, 1♀ - Frequent. Larval hosts: *Salix phylicifolia, S. aurita, S. caprea* and *S. cinerea*.

Phyllocolpa leucosticta (Hartig, 1837): Zselicszentpál, 03. 05. 2009, 1♀ - Frequent. *Salix aurita, S. caprea, S. atrocinerea* and *S. cinerea*.

Pikonema scutellatum (Hartig, 1837): Zselickislak, 08. 05. 2009, 1♂ - Rare in Hungary. Hostplants: *Picea* spp.

Pontania (Pontania) proxima (Serville, 1823): Szenna: Denna meadow (Dennai-rét), 21. 06. 2009, 8 pcs. galls - Frequent, larva on *Salix fragilis* and *S. alba*.

Pontania (Eupontania) viminalis (Linné, 1758): Zselickislak, 20. 06. 2009, 5 pcs. galls - Sporadic. Larva on *Salix purpurea*.Pristiphora (Pristiphora) armata (C. G. Thomson, 1863): Kaposvár: Zaranyi forest (Zaranyi-erdő), 09. 06. 1989, 1♂, Kaposfő, 18. 05. 1989, 1♂, Kaposmérő, 31. 07. 1991, 1♀, 09. 08. 1991, 1♀ - Frequent. Larva on Crataegus spp.

Pristiphora (Pristiphora) bifida (Hellén, 1947): Szenna: Denna meadow (Dennai-rét), 26. 04. 2009, 1♀, Szentbalázs: Herceg-képe, 15. 05. 2009, 1♀ - Sporadic. Larva on *Salix* spp.

Pristiphora (Lygaeonematus) compressa (Hartig, 1837): Simonfa: fir forest (fenyves), 09. 05. 2009, 1♀ - Sporadic. Larva on *Picea* spp.

Pristiphora (Pristiphora) conjugata (Dahlbom, 1835): Kaposmérő, 03. 07. 1990, 1♀, Kaposfő, 09. 06. 1991, 1♀ - Sporadic. Larva on *Populus tremulus* and *Salix fragilis*.

Pristiphora (Pristiphora) insularis Rohwer, 1910: Zselickislak, 01. 05. 2009, 1♂ - Sporadic. Larva on *Rosa* spp.

Pristiphora (Oligonematus) laricis (Hartig, 1837): Lad: Kótai forest (Kótai-erdő), 04. 05. 1994, 1♀ - Sporadic. Hostplants: *Larix* spp.

Pristiphora (Lygaeotus) pallidiventris (Fallén, 1808): Kaposmérő, 28. 04. 1991, 1♀ - Frequent. Larva on *Geum, Potetilla, Rubus* and *Filipendula* spp.

Pseudodineura fuscula (Klug, 1816): Kaposmérő, 23. 03. 1991, 2♀, 04. 04. 1991, 1♀ - Sporadic. Larval hosts: *Ranunculus* spp.

Discussion

The recorded total of 192 species is very high, although the 3 years collection around Kaposmérő and further 1 year collection in the Northern Zselic are not adequate to assess the real species richness. Compared to other faunistic investigations, the average species richness of a single territory, depending on its size, ranges from 80 to 150 species. The Bakony Mountains has the highest diversity with 269 species, the next is the Bükk Mts. with 231 species, then the Zselic Hills in third place with its recorded 192 species.

These 192 species represent 33% of the Hungarian sawfly fauna (589 species in total) and 25% of that of the Carpathian Basin (782 species in total).

Arge melanochra (Gmelin, 1790), *Athalia rosae* (Linné, 1758), *Dolerus* (*Poodolerus*) *nigratus* (O. F. Müller, 1776), *Eutomostethus ephippium* (Panzer, 1798), *Aglaostigma* (*Astochus*) *aucupariae* (Klug, 1817), *Aglaostigma* (*Astochus*) *fulvipes* (Scopoli, 1763), *Macrophya* (*Macrophya*) *albicincta* (Schrank, 1776), *Macrophya* (*Macrophya*) *montana* (Scopoli, 1763), *Pachyprotasis rapae* (Linné, 1767) and *Tenthredo* (*Temuledo*) *temula* Scopoli, 1763 are the dominant species. They amount to more than 50% of the total collected material.

The rarest species are discussed below.

Pamphilius ignymontiensis Lacourt, 1973 (Fig. 10) - Recently separated from the closely related *Pamphilius aurantiacus* (Giraud, 1857) (ACHTERBERG and AARTSEN 1986). The species is distinguished by the smooth vertex and black lateral fields of frons in *P. ignymontiensis*, and punctured vertex, and orange lateral fields in *P. aurantiacus*. In the Carpathian Basin, it is recorded from Borosjenő and the Retyezát Mountains (ZOMBORI 2003), furthermore we have data from Budapest: Gellérthegy, Kalocsa, Szilvásvárad and Nagykovácsi (ROLLER and HARIS 2008). In Europe, we have records from Austria, from the former Yugoslavia and Italy (ACHTERBERG and AARTSEN 1986). Hostplants are *Acer platanoides* and *Acer campestre*.

Calameuta (Calameuta) punctata (Klug, 1803) - Rare species, although it was captured in several places in the Carpathian Basin. We know it from Budapest, Szatmár, Pásztó, Ohat, Újszentmargita, Alsócsákány, Látrány, Nagyvárad, Peleszántó, Mehádia, Zilah, Perkupa, Marcali: Boronka, Hubó, Körmöcbánya and Szentistvánkút (MOCSÁRY, 1900, ZOMBORI 1979, 1981, 1996, HARIS 2003, ROLLER and HARIS 2008, ZILAHI-KISS 1904).

Aproceros leucopoda Takeuchi, 1939 (Fig. 11) - Mr. Thomasz Huflejt and Dr. Stephan Blank helped and advised the author. The identification is dubious in TOGASHI (1968). In colour, this species runs to *A. umbricola* Malaise, in the shape of scutellum to *A. leucopoda* Takeuchi. Stephan Blank compared the European specimens to the types and found they belong to *A. leucopoda* Tak. In interesting way, the Polish specimens are typical *A. leucopoda* and well agree those described in Togashi's paper. Probably the fotoperiodic effect influence the morphology of the spring and summer generation. For generic identification, the generic revision of Koch is useful (KOCH 1988). Its known hostplant is Manchurian elm (*Ulmus laciniata*). In Szenna, where I captured these 2♀ (Fig 5), *Ulmus minor, U. scabra* and *U. laevis* grow. The present specimens are not the first Hungarian record! The earliest Hungarian records (few years older than the present record) will soon be separately published by Blank and Vékony. These records are not discussed here, we

should wait for the publication of Dr. Blank and Dr. Vékony. From Europe, Mr. Thomasz Huflejt identified this species firstly, in 2003, using the keys of Togashi, 1968 and Lelej and Taeger, 1997: "*Forest District Stale near Tarnobrzeg, Poland, 11.6.2003, 7 ♀, captured at the margin of an oak-hornbeam forest, A. leucopoda Tak. Det.: T. Huflejt, 2003*". Earlier, it was also captured in the Russian Far East (Primorskij Kraj, Kamenushka near Ussurijsk, 2.8.1992, 2♀, 3♂, leg. J. Sawoniewicz). All specimens are in the Museum and Institute of Zoology Pas, Warsaw, Poland. (Huflejt, pers. com. and permission).

Gilpinia laricis (Jurine, 1807) (Fig. 12) - We know this species only from few locations throughout the Carpathian Basin. Firstly, Strobl recorded it at the River Piesting (Austria – Österreich) (STROBL 1895). Further places of capture: Sasvár, Lukó, Kőszeg, Visnyeszéplak, Nagyszeben, Tompa, Disznód, Györgyfalva, Budakeszi és Székelyfalva (PÁDR 1990, ROLLER atl al., 2006, MÓCZÁR and ZOMBORI 1973, SCOBIOLA-PALADE 1982 and PASCU 1978).

Stromboceros delicatulus (Fallén, 1808) (Fig. 7) - Widely distributed in the mountainous area of the Carpathian Basin: Trencsén, Balázsvágás, Limpak, Szentistvánkút, Istvánkirályfalva, Jávori hágó, Deménvölgy, Lukó, Feketevág, Tusnádfürdő, Rétbánya, Sztranszka, Szent Anna-tó, Fekete Tisza, Apsinec, Berlebán, Kvasznij patak, Pop Iván, Alsóláz, Brebenyeszkul, Mencsil, Trebusafejérpatak, Körmöcbánya, Szacsva, Bélai Tátra: Hátsó Rézaknák, Magas Tátra: Hátsó Jávor völgy, Tajó, Kirujfürdő, Tolvajos patak, Zeteváralja, Szencsed patak, Resinár and Uglya (MOCSÁRY 1900, ROLLER 1999a, 2006, ROLLER and HARIS 2008, ZOMBORI 1982, ZOMBORI and ERMOLENKO 1999). In the Post-Trianon Hungary, known only from the Mátra Mountains (Pisztrángos tó) (ZOMBORI 1976). In the Zselic hills, 1♀ (Cserénfa) and 1♂ (Zselickisfalud) were captured, both of them collected on Athyrium filix-femina.

Dolerus (Poodolerus) blanki Liston, 1995 - Very rare species. Only 4 specimens were captured in the Post-Trianon Hungary, one female from Darány (Somogy county), one female at Kis-Balaton (border of Zala and Somogy counties) and this male is from Kaposvár (Somogy county), the Szeged: Fehértó specimen lost (MOCSÁRY 1900, ZOMBORI 1982, 1985a). From the territory of the Royal Hungary, it is reported from Homonna, Hátszeg, Tasnád, Nagyszeben, Magura, Vízakna, Szenterzsébet, Pöltinis, Gyilkos tó, Fogaras, Szinája and Ogulin (MOCSÁRY 1900, SCOBIOLA-PALADE 1978).

Harpiphorus lepidus (Klug, 1818) - Larvae skeletonizes oak (*Quercus* spp.) leaves. Rare, although it was reported from the former Yugoslavia as a pest. From our present territory it is known from Budapest, Badacsony, Nadap, Őrszentmiklós, Peszér and Nova (MOCSÁRY 1900, ZOMBORI 1982). Also known from Szitnya, Malacka, Ihelník, Kereszténysziget, Nagyszeben, Hadad, Hajnica, Vágújhely, Vágsziklás, Nemesváralja and Homoródkeményfalva. (PATOCKA et al., 1962, ROLLER 1996, 1999a, 2004, ZOMBORI 1982, SCOBIOLA-PALADE 1981, ROLLER and HARIS 2008).

Fenusella nana (Klug, 1816) - Very rare species mentioned by Strobl firstly from the Carpathian Basin at River Piesting (STROBL 1896). In an interesting way, Tóth listed it in the insect pests of forests (TÓTH 1999). In the present territory of Hungary we know it only from Csévharaszt (1♀, captured 1st of May, 1978) (ZOMBORI 1985b, 1990). From Erdély, we know from Betlen, Beszterce-Naszód (SCOBIOLA-PALADE 1974). Nowicki reported it from Galicia: Sambor (NOWICKI 1864). This specimen was collected as a larva on Silver Birch (*Betula pendula*) at Lake Petörke at Kaposszentbenedek (close to

the road to Szenna). For identification of the larva, the book by LORENZ and KRAUS (1957) and the site of KIMBER et al. (2003) (British leafminers) were used. Roller and Haris suggested that this species should be included in the red book of the Carpathian Basin (ROLLER and HARIS 1998).

Paracharactus (Dicrostema) gracilicornis (Zaddach, 1859) (Fig. 9) - New record for Hungary. From the Carpathian Basin we have only 1 indefinite record: North-East Croatia (PEROVIC and LEINER 1996). The species is well separable from the other Phymatocerini by its whitish knees, large membraneous blotch on propodeum, the whitish or brownish-white edges of clypeus and whitish labrum. Larva feeds on *Adoxa moschatellina*.

Parna tenella (Klug, 1816) - From our present territory, this species is known from Bátorliget and Kaposmérő (ZOMBORI 1990a,b, HARIS 1998). From the Carpathian Basin, it is also known from Dévény, Csicsó, Malacka, Mosóc, Dévényújfalu, Kopács Island, Mehádia, Bánát, Borosjenő, Bezirk, Morvamogyoród, Vágsziklás and Szászka (LUKAS 1992, ROLLER 1999a, b, 2005, 2007, MOCSÁRY 1900, ZOMBORI 1990, SCOBIOLA-PALADE 1974, 1981). This species is definitely *Parna tenella* Kl. not the similar *Parna apicalis* Brischke. Larvae make mine in leaves of *Tilia* spp.

Macrophya (Macrophya) tenella Mocsáry, 1881 (Fig. 8) - The type locality (locus typicus) of this species is Budapest: Farkasvölgy (MOCSÁRY 1900). Known also from Cserépfalu and Simontornya (ZOMBORI 1996). It is also reported from Párkány, Dévény, Vágluka, Széleskút, Gyerővásárhely, Nagyszeben, Zágráb and Felsőkalosa (LUKAS 1992, ROLLER 1999, 2005, SCOBIOLA-PALADE 1967, 1978, JENDEKOVÁ 1988, ROLLER and HARIS 2008). Out of the Carpathian Basin, known also from Bulgaria, France, Spain and Germany (LISTON 1995).

Tenthredo (Maculedo) vespiformis Schrank, 1781 (Fig. 6) - Relatively rare Tenthredo species in the Carpathian Basin recorded firstly from Budapest (MOCSÁRY 1900) and from Simontornya by Lujza Pillich (PILLICH 1930). Known also from Dévény, Vöröskő, Nagykovácsi, Balatonfüred, Csesznek, Isztimér, Vállus, Szőlősgyula, Feketeardó, Hömlőc, Óbást: Pogányvár, Kisgömöri, Gömör, Dévényújfalu, Récse, Sajógömör and Domogled (LUKAS 1992, LUKAS and SCHLARMANNOVÁ 1998, ROLLER 1999a, b, ZOMBORI 1975, 1980, BOKOTEY 1956, ROLLER and HARIS 2008).

Acknowledgements

I express my grateful thanks to Mr. Ottó Pintér (Sefag, Zselic Forestry), Dr. Levente Ábrahám (SMMI), Mr. Tomasz Huflejt (Zool. Mus. and Inst. Warsawa, PAS), Mr. Zsolt Józan, Dr. Magdolna Juhász (SMMI), Mr. Andrew Liston (DEI) and Dr. Stephan Blank (DEI).

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DOI:10.24394/NatSom.2009.15.159 | Natura Somogyiensis | 15 | 159-180 | Kaposvár, 2009

Contribution to the knowledge of the Croatian Aculeata fauna (Hymenoptera, Aculeata)

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Józan, Zs.: *Contribution to the knowledge of the Croatian Aculeata fauna (Hymenoptera, Aculeata).*
Abstract: In this paper, the author summarizes faunistical data of Croatian Aculeata collected between 2001 and 2009. Altogether 527 species of 9 families were collected. Twelve species, namely: *Psen exaratus* (Eversmann, 1849), *Anthidium grohmanni* Dahlbom, 1854, *Ceratina dentiventris* Gerstaecker, 1889, *Chelostoma styriacum* Schwarz & Gusenleitner, 1999, *Coelioxys obtusa* Pérez, 1884, *Eucera dalmatica* Morawitz, 1872, *Eucera eucnemidea* Dours, 1873, *Eucera parvula* Smith, 1854, *Osmia campanularis* Morawitz, 1877, *Osmia perezi* Ferton, 1895, *Lasioglossum bischoffi* (Blüthgen 1931), *Stelis minuta* Lepeletier & Serville, 1825 are new records for the Croatian fauna.

Keywords: Hymenoptera, Aculeata, faunistical data, Croatia, new records

Introduction

Between 2001 and 2009, 8 expeditions were taken to Croatia. There were 82 different collecting sites in Istria Peninsula and Northern Dalmatian Coast, The major part of the collected specimens was caught by the author and his wife, Mrs. Maria Józan. Dr. Levente Ábrahám and Mr. Zoltán Héra also collected some bees and wasps.

Altogether 527 species of 9 families were collected. In the historical Hungarian literature (before 1920), 440 species were mentioned from this area captured in the Northern Dalmatian Coast and the surroundings of the Kvarner gulf Bajári (1956, 1957), Bajári & Móczár, L. (1954), Móczár, L. (1956, 1958, 1995), Móczár, M. (1953, 1955, 1956, 1958a, 1958b, 1958c, 1959, 1961a, 1961b), Móczár, L. & Schwarz (1968, 1970), Móczár, L. & Warncke (1972). 440 species were recorded from this area which were captured in the Northern Dalmatian Coast and in the surroundings of the Kvarner gulf. Further faunistical data from this region are presented in various monographs (Ducke 1900, Friese 1896, 1897, Pulawski 1971, etc.) and papers (Ebmer 1988, Gusenleitner 1996, Petersen 1988, Schwarz 1967, Tkalců 1974, Warncke 1978, etc.). For checking the new records for Croatia, the Fauna Europaea database was consulted (Noyes 2007).

Psen exaratus (Eversmann, 1849) (Sphecidae), *Anthidium grohmanni* Dahlbom, 1854, *Ceratina dentiventris* Gerstaecker, 1889, *Chelostoma styriacum* Schwarz & Gusenleitner, 1999, *Coelioxys obtusa* Pérez, 1884, *Eucera dalmatica* Morawitz, 1872, *Eucera eucnemidea* Dours, 1873, *Eucera parvula* Smith, 1854, *Osmia campanularis* Morawitz, 1877, *Osmia perezi* Ferton, 1895, *Lasioglossum bischoffi* (Blüthgen 1931), *Stelis minuta* Lepeletier & Serville, 1825 (Apidae) are new records for the Croation fauna.

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

The following rare species are worth mentioning: *Chrysis aestiva* Dahlbom, 1854, *Chrysis analis* Spinola, 1808, *Cleptes aerosus* Förster, 1853, *Cleptes saussurei* Mocsáry, 1899 (Chrysididae), *Leptochilus josephi* Giordani Soika, 1947 (Vespidae), *Cerceris specularis* Costa, 1869, *Harpactus consanguineus* (Handlirsch, 1888), *Harpactus niger* Costa, 1858, *Passaloecus ribauti* Merisuo, 1974, *Passaloecus vandeli* Ribaut, 1952 (Sphecidae), *Andrena nigroolivacea* Dours, 1873, *Anthidium undulatum* Dours, 1873, *Ceratina bispinosa* Handlirsch, 1889, *Ceratina dallatorreana* Friese, 1896, *Ceratina parvula* Smith, 1854, *Eucera caspica* Morawitz, 1873, *Eupavlovskia funeraria* (Smith, 1854), *Halictus gemmeus* Dours, 1872, *Lasioglossum pseudocaspicum* (Blüthgen, 1923), *Megachile bicoloriventris* Mocsáry, 1878, *Nomada facilis* Schwarz, 1967, *Nomada incisa* Schmiedeknecht, 1882, *Nomada verna* Schmiedeknecht, 1882, *Osmia cyanoxantha* Pérez, 1879, *Osmia dalmatica* Morawitz, 1872, *Osmia padri* (Tkalců, 1974), *Osmia rubicola* Friese, 1891, *Osmia tenuispina* Alfken, 1937 (Apidae) are new records for the Croation fauna.

List of collected sites

Istria:
Barban – 16 km W from Labin
Brovinje – 15 km S from Labin
Brseč – 19 km S from Lovran
Cavići (Zagorje) – 20 km S from Lovran
Cerovica (Ravni) – 2 km W from Ravni
Funtana – 6 km S from Poreč
Golovik – 17 km S from Lovran
Garčišće – 11 km SE from Pazin
Kanfanar: Dvigrad – 16 km E from Rovinj
Kapelica – 2 km W from Labin
Karojba – 13 km NW from Pazin
Koromačno – 18 km S from Labin
Limski kanal – 5 km N from Rovinj
Lindar – 3 km E from Pazin
Marčana – 15 km NE from Pula
Martina – 18 km S from Lovran
Medulin – 7 km SE from Pula
Medveja – 4 km S from Lovran
Mošćenice – 12 km S from Lovran
Mošćenička Draga – 9 km S from Lovran
Most-Raša – 10 km SW from Labin
Načinovići (Zagorje) – 28 km S from Lovran
Petehi – 6 km W from Barban
Pićan – 18 km E from Pazin
Plomin – 12 km NE from Labin
Poreč
Prešika – 2 km W from Labin
Ravni – 14 km S from Labin
Reburići – 8 km S from Labin
Rovini – 2 km S from Mošćeniče
Rovinj
Rovinjsko Selo – 6 km E from Rovinj
Salakovci – 13 km S from Labin
Skitača – 4 km E from Koromačno
Španidiga – 4 km SE from Rovinj
Stanišovi – 11 km S from Labin
Strepčići – 7 km NE from Labin
Sveta Jelena – 16 km S from Lovran
Sveta Katarina – 18 km SE from Pazin
Sveti Nikola (Rakalj) – 15 km NE from Marčana
Vela Učka – 17 km W from Lovran
Vranja – 25 km W from Lovran
Vrsar – 9 km S from Poreč

Northern Dalmatia:
Barić Draga – 30 km SE from Karlobag
Baške Oštarie – 20 km E from Karlobag
Bibinje – 5 km S from Zadar
Briševo – 15 km NE of Zadar
Devičić Draga – 20 km SE from Karlobag
Donji Lopci – 8 km E from Senj
Gorica – 18 km SE from Zadar
Gornji Poličnik – 12 km NE from Zadar
Kakma – 7 km E from Biograd
Karlobag
Klenovica – 10 km SE from Novi Vinodovski
Lukovo Šugarje – 13 km SE from Karlobag
Matesiči – 4 km E from Senj
Melvice – 15 km E from Senj
Modriči – 20 km S from Senj
Nin – 14 km N from Zadar
Polača – 11 km E from Biograd
Radelić Draga – 10 km SE from Karlobag
Senj
Starigrad-Paklenica – 44 km SE from Karlobag
Susanj – 9 km E from Karlobag
Tribanj Kruščica – 29 km SE from Karlobag
Trolokve – 20 km NW from Karlobag
Zadar

In other regions:
Bakar
Bakarac – 6 km S from Bakar
Fužine – 30 km E from Bakar
Gornji Dobra – in Mountains Great Kapela
Grabrk – 15 km N from Ogulin
Hreljin – 12 km SE from Bakar

Njivice – 6 km S from Omišalj
Krk – a town in isle Krk
Near the bridge of isle Krk (in text: n. b. of Krk)
Omišalj – in isle Krk
Podhum – 20 km NE from Rijeka
Rava Gora – in Mountains Great Kapela
Rijeka: Pehljin
Sveti Vid-Miholjice – 11 km S from Omišalj
Vrelo – 20 km SW from Plitvice

List of collected species

Tiphiidae
Meria tripunctata (Rossi, 1790) – Kakma, 21. 06, 2007., 2♂
Tiphia fulvipennis Smith, 1857 – Lindar, 17. 06, 2009., 1♀
Tiphia morio Fabricius, 1787 – Kapelica, 26. 04, 2007., 4♂

Sapygidae
Sapyga clavicornis (Linnaeus, 1758) – Martina, 26. 04, 2007., 1♀
Sapygina decemguttata (Jurine, 1807) – Krk, 25. 06, 2005., 2♀; Mošćenička Draga, 20. 06, 2003., 1♀

Scoliidae
Colpa interrupta (Fabricius, 1781) – Nin: beach, 20. 06, 2007., 4♂
Scolia hirta (Schrank, 1781) – Brseč (N 3 km), 18. 06, 2001., 2♂; Golovik, 15. 06, 2009., 1♂; Kanfanar: Dvigrad, 207. 06, 2005., 1♂; Karlobag, 19. 06, 2007., 1♂; Koromačno, 20. 06, 2001., 1♂; Načinivići (Zagorje), 29. 05, 2008., 1♂; Nin: beach, 20. 06, 2007., 1♂; Polača, 21. 06, 2007., 1♂; Radelić Draga, 19. 06, 2009., 1♂; Most-Raša, 06. 22, 2003., 1♀; Susanj, 22. 06, 2007., 1♀; Sveta Jelena, 06. 20, 2003., 1♂; Sveti Nikola (Rakalj), 22. 06, 2001., 1♂; Vrsar, 26. 06, 2004., 1♂
Scolia insubrica (Scopoli, 1786) – Nin: beach, 20. 06, 2007., 2♀; Most-Raša, 06. 22, 2003., 5♀ 1♂; Sveta Jelena, 23. 06, 2003., 2♀; Zadar, 01. 07, 2007., 1♀
Scolia quadripunctata (Fabricius, 1775) – Devicić Draga, 19. 06, 2009., 1♂; Gornji Poličnik, 20. 06, 2007., 1♂; Klenovica, 18. 06, 2009., 1♀; Krk, 25. 06, 2005., 1♂; Nin. beach, 20. 06, 2007., 1♂; Pićan, 17. 06, 2007., 1♂; Senj, 18. 06, 2009., 2♂; Susanj, 22. 06, 2007., 1♂; Sveta Jelena, 15. 06, 2009., 1♂;

Mutillidae
Dasylabris maura (Linnaeus, 1758) – Stanišovi, 05. 29, 2008., 1♀; Sveta Jelena, 25. 04, 2007., 1♀
Mutilla marginata Baer, 1848 – Koromačno, 11-15. 07, 1994., 1♂ (leg. Ábrahám)
Myrmilla calva (Villers, 1789) – Golovik, 28. 05, 2008., 1♀; Hreljin, 27. 04, 2007., 1♀; Karlobag, 22. 06, 2007., 1♀; Most-Raša, 27. 05, 2008., 1♀; Rovini, 16. 06, 2009. 1♀; Sveta Jelena, 25. 04, 2007., 2♀
Myrmilla mutica (André, 1893) – Most-Raša, 27. 05, 2008., 1♀
Nemka viduata (Pallas, 1773) – Gornji Poličnik, 20. 06, 2007., 1♂; Nin: beach, 20. 06, 2007., 1♂
Physetopoda daghestanica (Radoszkovski, 1885) – Koromačno, 11-15. 07, 1994., 4♂ (leg. Ábrahám)
Tropidotilla litoralis (Petagna, 1787) – Golovik, 28. 05, 2008., 2♀

Chrysididae
Chrysis aestiva Dahlbom, 1854 – Brseč (N 3 km), 19. 06, 2001., 1♂
Chrysis analis Spinola, 1808 - Brseč (N 3 km), 19. 06, 2001., 1♀
Chrysis aurotecta Abeille, 1878 – Sveta Jelena, 25. 04, 2007., 1♀
Chrysis comparata Lepeletier, 1806 – Rovini, 16. 06, 2009., 1♀ 3♂
Chrysis germari Wesmael, 1830 – Rovini, 16. 06, 2009. 2♀
Chrysis grohmanni Dahlbom, 1854 – Rovini, 16. 06, 2009., 1♂
Chrysis inaequalis Dahlbom, 1854 – Golovik, 26. 05, 2008., 2♀, 15. 06, 2009., 1♀
Chrysis ragusae Destefani, 1888 – Brseč (N 3 km), 19. 06, 2001., 1♂; Rovini, 16. 06, 2009., 2♀ 2♂
Chrysis ramburi Dahlbom, 1854 – Golovik, 16. 06, 2009., 1♀; Lindar, 17. 06, 2009., 1♀
Chrysis rutilans Olivier, 1790 – Marčana, 22. 06, 2003., 1♀
Chrysis scutellaris Fabricius, 1794 – Cavići (Zagorje), 24. 06, 2005., 1♂; Rovini, 16. 06, 2009., 1♂
Chrysis splendidula Rossi, 1790 – Stanišovi, 29. 05, 2008., 1♀

Chrysis subsinuata Marquet, 1879 – Brseč (N 3 km), 19. 06, 2001., 1♀
Chrysis succincta Linnaeus, 1761 – Nin: beach, 20. 06, 2007., 1♀
Chrysis viridula cylindrica Eversmann, 1857 – Sveta Jelena, 04. 26, 2007., 1♀
Chrysura candens (Germar, 1817) – Rovini, 26. 05, 2008., 1♀
Chrysura cuprea (Rossi, 1790) – Njivice, 27. 04, 2007., 1♀; Sveta Jelena, 28. 05, 2008., 2♀, 27. 04, 2007., 1♀ 1♂; Vranja (E 5 km), 28. 05, 2008., 3♀
Chrysura dichroa dichroa (Dahlbom, 1854) – Načinovići (Zagorje), 28. 05, 2008., 1♀; Stanišovi, 29. 05, 2008., 1♀
Chrysura dichroa socia (Dahlbom, 1854) – n. b. of Krk, 27. 04, 2007., 1♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♀
Chrysura hybrida (Lepeletier, 1806) – Rovini, 26. 05, 2008., 1♂; Stanišovi, 29. 05, 2008., 1♂
Chrysura ignifrons (Brullé, 1832) – near brige of Krk, 27. 04, 2007., 2♀
Chrysura refulgens (Spinola, 1806) – Cavići (Zagorje), 25. 06, 2004., 1♀; Mošćenice, 15. 06, 2009., 1♀; Pićan, 17. 06, 2009., 1♀
Cleptes aerosus Förster, 1853 – Bršec (N 3 km), 19. 06, 2001., 1♂
Cleptes saussurei Mocsáry, 1899 – Vela Učka, 16. 06, 2009., 1♀
Hedychridium roseum (Rossi, 1790) – Kanfanar: Dvigrad, 27. 06, 2005., 1♂
Hedychrum gerstaeckeri Chevrier, 1869 – Sveta Jelena, 26. 05, 2008., 1♀
Hedychrum niemelai Linsenmaier, 1959 – Lindar, 17. 06, 2009., 1♀; Ravni, 29. 05, 2008., 3♀
Hedychrum nobile (Scopoli, 1763) – Marčana, 22. 06, 2003., 1♂
Holopyga fervida (Fabricius, 1781) – Bršec, 25. 06, 2005., 1♂; Cavići (Zagorje), 24. 06, 2005., 1♂; Koromačno (N 3 km), 21. 06, 2001., 1♂
Omalus biaccinctus (Buysson, 1893) – Koromačno (E 3 km), 20. 06, 2001., 1♀; Matesiči, 19. 06, 2007., 1♀; Rovini, 16. 06, 2009., 1♀
Parnopes grandior (Pallas, 1771) – Nin: beach 20.06, 2007., 1♂
Philoctetes sculpticollis (Abeille, 1878) – Sveta Jelena, 16. 06, 2009., 1♀
Pseudomalus auratus (Linnaeus, 1758) – Mošćenice, 26. 05, 2008., 1♂; Sveta Jelena, 16. 06, 2009., 3♀
Pseudomalus pusillus (Fabricius, 1804) – Moščenićka Draga, 20. 06, 2003., 1♂
Pseudospinolia uniformis Dahlbom1854 – Cavići (Zagorje), 24. 06, 2005., 1♂; Vranja (E 5 km), 28. 05, 2008., 1♀
Spintharina versicolor Spinola, 1808 – Koromačno (E 3 km), 20. 06, 2001., 1♂
Stilbum cyanurum (Forster, 1771) – Sveta Jelena, 20. 06, 2003., 1♀; Vrsar, 26. 06, 2004., 1♀

Pompilidae

Agenioideus apicalis (Vander Linden, 1827) – Barban, 22. 06, 2003., 1♀
Agenioideus nubecula (Costa, 1874) – Krk, 25. 06, 2005., 1♀; Mošćenice,15, 06, 2009., 1♀ 1♂; Pićan, 17. 06, 2009., 1♀; Rovini, 16. 06, 2009.,1♀
Agenioideus sericeus (Vander Linden, 1827) – Pićan, 17. 06, 2009., 1♂,; Skitača, 21. 06, 2001., 1♂
Anoplius infuscatus (Vander Linden, 1827) – Nin: beach, 20. 06, 2007., 1♀
Anoplius viaticus paganus (Dahlbom, 1843) – Gornji Jelenje, 21, 06, 2003., 1♂; Polača, 21. 06, 2007., 1♀
Anospilus orbitalis (Costa, 1863) – Brseč (N 3 km), 18. 06, 2001., 1♀
Aporinellus sexmaculatus (Spinola, 1805) – Golovik, 16. 06, 2009., 1♂; Karlobag, 22. 06, 2007., 1♀
Arachnospila trivialis (Dahlbom, 1843) – Most-Raša, 27. 05, 2008., 1♂
Auplopus carbonarius (Scopoli, 1763) – Kanfanar: Dvigrad, 27. 06, 2008., 1♀; Koromačno, 21. 06, 2001., 1♀; Marčana, 22. 06, 2003., 1♀; Mošćenice, 26. 05, 2008., 2♂; Omišalj, 27. 04, 2007., 1♂; Rovini, 26. 05, 2008., 1♀
Auplopus rectus (Haupt, 1926) – Bršec (N 3 km), 19. 06, 2001., 1♀; Golovik, 16. 06, 2009., 1♀; Mošćenice, 26. 05, 20089., 1♂; Sveta Jelena, 15. 06, 2009., 2♀
Batazonellus lacerticida (Pallas, 1771) – Most-Raša, 22. 06, 2003., 1♀
Cryptocheilus alternatus (Lepeletier, 1845) – Susanj, 10. 07, 1988., 1♀ (leg. Ábrahám)
Cryptocheilus guttulatus (Costa, 1887) – Brseč (N 3 km), 19. 06, 2001., 1♀, Pićan, 17. 06, 2009., 1♀
Cryptocheilus ichneumonoides (Costa, 1874) – Funtana, 26. 06, 2004., 1♂
Cryptocheilus notatus affinis (Vander Linden, 1827) – n. b. of Krk, 30. 05, 2008., 1♂
Cryptocheilus octomaculatus (Rossi, 1790) – Koromačno (E 3 km), 20. 06, 2001., 2♂
Cryptocheilus variabilis (Rossi, 1790) – Strepčići, 22. 06, 2001., 1♀, Sveta Jelena, 24. 06, 2005., 1♂
Cryptocheilus versicolor (Scopoli, 1763) – Brseč (N 3 km), 19. 06, 2001., 1♀

Dicyrtomellus luctuosus (Mocsáry, 1879) – Brseč (N 3 km), 18. 06, 2001., 1♂
Dipogon variegatus (Linnaeus, 1758) – Sveta Jelena, 26. 04, 2007., 1♂
Episyron albonotatus (Vander Linden, 1827) – Donji Lopci, 19. 06, 2007., 1♀
Evagetes siculus (Lepeletier, 1845) – Limski kanal, 26. 06, 2004., 1♂
Pompilus cinereus (Fabricius, 1775) – Nin:++++ beach, 20. 06, 2007., 1♀ 1♂
Priocnemis melanosoma Kohl, 1880 – Sveta Jelena, 25. 04, 2007., 1♂
Priocnemis pusilla Schiödte, 1837 – Moščenićka Draga, 20. 06, 2003., 1♂
Priocnemis sulci Balthasar, 1943 – Reburići, 04. 26, 2007., 1♀; Golovik, 28. 05, 2008., 2♀; Martina, 28. 05, 2008., 1♀

Vespidae
Vespinae
Dolichovespula sylvestris (Scopoli, 1763) – Rovini, 16. 06, 2009., 1♀
Polistes nimpha (Christ, 1791) – Donji Lopci, 19. 06, 2007., 1♀
Polistes omissus (Weyrauch, 1939) – Karlobag, 18. 06, 2009., 1♀, Lukovo Šugarje, 19. 06, 2009., 2♀, Radelić Draga, 19. 06, 2009. ,1♀; Senj, 18. 06, 2009., 2♀

Eumeninae
Alastor biegelebeni Giordani Soika, 1942 – Polača, 21. 06, 2007., 3♀
Allodynerus floricola (Saussure, 1853) – Golovik, 26. 05, 2008., 1♀; Koromačno (E 3 km), 21. 06, 2001., 1♀
Ancistrocerus acutus (Fabricius, 1793) – Barban, 22. 06, 2003., 1♂; Cavići (Zagorje), 24. 06, 2005., 1+♂; Mošćenice, 15. 06, 2009. 1♂
Ancistrocerus gazella (Panzer, 1798) – Most-Raša, 22. 06, 2003., 1♂; Sveta Jelena, 16. 06, 2009., 1♂; Vela Učka, 16. 06, 2009., 1♂;
Ancistrocerus nigricornis (Curtis, 1826) – Podhum, 15. 06, 2009., 1♀; Vela Učka, 16. 06, 2009., 1♀
Ancistrocerus oviventris (Wesmael, 1836) – Cavići (Zagorje), 24. 06, 2005., 1♀; Golovik, 26. 05, 2008., 1♀; Koromačno (E 3 km), 20. 06, 2001., 3♀ 1♂; Polača, 21. 06, 2007., 3♂; Vranja (E 5 km), 28. 05, 2008., 1♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♂
Delta unguiculatum (Villers, 1789) – Cerovica (Ravni), 21. 06, 2003., 1♂; Koromačno (E 3 km), 20. 06, 2001., 2♀; Koromačno: Tunarica, 21. 06, 2003., 1♀; Medveja, 29. 07, 2002., 2♀ (leg. Héra, Z.); Most-Raša, 22. 06, 2003., 1♂; Rovinjko Selo, 27. 06, 2005. 1♀; Radelić Draga, 19. 06, 2009., 2♀; Most-Raša, 22. 06, 2003., 1♂; Sveta Jelena, 20. 06, 2003., 3♂; Trolokve, 23. 06, 2007. 1♀
Eumenes coarctatus (Linnaeus, 1758) – Golovik, 26. 05, 2008., 1♂; Kanfanar: Dvigrad, 27. 05, 2008. 1♂; Omišalj, 27. 04, 2007., 1♀; Pićan, 17. 06, 2009., 1♂; Sveta Katarina, 27. 05, 2008., 1♀; Sveta Jelena, 20. 06, 2003., 1♀
Eumenes coronatus (Panzer, 1799) – Sveta Jelena, 20. 06, 2003., 1♀
Eumenes lunulatus Fabricius, 1804 – Barić Draga, 22, 06, 2007., 1♂; Bibinje, 3-10. 08, 2002., 1♂ (leg. Ábrahám); Cavići (Zagorje), 24. 06, 2005., 1♂; Devičić Draga, 19. 06, 2009., 1♂; Golovik, 28. 05, 2008. 1♀ 1♂; Gornji Poličnik, 20. 06, 2007.,2♂; Krk, 25. 06, 2005., 1♀; n. b. of Krk, 27. 04, 2007., 1♂; Modriči, 19. 06, 2007., 2♂; Načinovići (Zagorje), 28. 05, 2008., 1♀; Omišalj, 27. 04, 2007., 1♂; Polača, 21. 06, 2007., 3♂; Radelić Draga, 19. 06, 2009., 1♀; Most-Raša, 22. 06, 2003., 1♂, 27. 05, 2008. 1♀; Sveti Nikola (Rakalj), 22. 06, 2001., 1♂; Sveta Jelena, 26, 04, 2007. 2♂, 15. 06, 2009., 1♂; Stanišovi, 29. 05., 2008., 1♂; Trolokve, 23. 06, 2007. 2♂
Eumenes mediterraneus Kriechbaumer, 1879 – Karlobag, 22. 06, 2007., 2♂, Polača, 21. 06, 2007., 1♂
Eumenes papillarius (Christ, 1791) – Raša, 22. 06, 2003., 1♂
Eumenes pedunculatus (Panzer, 1799) – Marčana, 22. 06, 2003., 1♂
Eumenes pomiformis (Fabricius, 1781) – Brseč, 25. 06, 2004., 2♂; Cerovica (Ravni), 21. 06, 2003., 1♂; Golovik, 26. 05, 2008., 1♂; Karlobag, 22. 06, 2007., 1♂; Klenovica 18. 06, 2009. 1♂; Koromačno (E 3 km), 20. 06, 2001., 1♀; near bridge of Krk, 30. 05, 2008., 1♂; Marčana, 22. 06, 2003., 1♂; Modriči, 19. 06, 2007., 2♂; Rovini, 16. 06, 2009., 1♀; Sveta Jelena, 15. 06, 2009., 2♀; Strepčići, 19. 06, 2001., 1♂
Eumenes sareptanus insolatus M. Müller, 1923 – Golovik, 16. 06, 2009., 1♀; Most-Raša, 27. 05, 2008., 1♂; Senj, 18. 06, 2009., 2♂; Španidiga, 27. 05, 2008., 1♂; Vrsar, 26. 16, 2004., 1♂
Eumenes subpomiformis Blüthgen, 1938 – Cavići (Zagorje), 28. 06, 2004., 2♀; Most-Raša, 22. 06, 2003., 1♀; Rovini, 26. 05, 2008., 1♀

Euodynerus dantici (Rossi, 1790) – Polača, 21. 06, 2007., 1♀
Euodynerus disconotatus (Lichtenstein, 1884) – Briševo, 21. 06, 2007., 1♂; n. b. of Krk, 18. 06, 2009., 1♂; Polača, 21. 06, 2007., 3♂; Sveti Nikola (Rakalj), 22. 06, 2001., 1♀
Euodynerus egregius unimaculatus (Maidl, 1922) – Koromačno, 20. 06, 2001., 1♀; Načinivići (Zagorje), 28. 05, 2008., 2♀ 2♂
Euodynerus quadrifasciatus (Fabricius, 1793) – Vela Učka, 28. 05, 2008., 1♂
Euodynerus posticus (Herrich-Schaeffer, 1841) – Brseč, 25. 06, 2004., 1♀; Sveta Jelena, 16. 06, 2009., 1♂
Gymnomerus laevipes (Shuckard, 1837) – Donji Lopci, 19. 06, 2007., 1♀
Katamenes arbustorum (Panzer, 1799) – Koromačno (N 3 km), 20. 06, 2001., 1♀; Stanišovi, 29. 05, 2008., 1♂
Leptochilus alpestris (Saussure, 1855) – Devičić Draga, 19. 06, 2009., 1♀
Leptochilus josephi Giordani Soika, 1947 – Brseč, 25. 06, 2005., 1♂; Golovik, 16. 06, 2009., 1♀; Senj, 18. 06, 2009., 1♀
Leptochilus limibiferus (Morawitz, 1867) – Klenovica, 18. 06, 2009., 1♂; n. b. of Krk, 18. 06, 2009., 1♂; Radelić Draga, 19. 06, 2009., 2♀
Leptochilus regulus (Saussure, 1856) – Kanfanar: Dvigrad, 27. 06, 2005., 1♀ 2♂; Krk, 25. 06, 2005., 1♀ 1♂; Marčana, 22. 06, 2003., 1♀; Senj, 18. 06, 2009., 1♀
Microdynerus longicollis Morawitz, 1895 – Brovinje, 23. 05, 2007., 1♀; Most-Raša, 27. 05, 2007., 1♂
Microdynerus nugdunensis (Saussure, 1856) – Krk, 25. 06, 2005., 1♀; Sveta Jelena, 16. 06, 2009., 1♀
Microdynerus timidus (Saussure, 1856) – Cerovica (Ravni), 26. 04, 2007., 1♂
Odynerus femoratus Saussure, 1856 – Ravni, 29. 05, 2008., 1♂; Sveta Jelena 28. 05, 2008., 1♂, 16. 06, 2009., 1♀
Odynerus melanocephalus (Gmelin, 1790) – Podhum, 15. 06, 2009., 1♀ 1♂
Odynerus poecilus Saussure, 1856 – Sveta Jelena, 25. 04, 2007., 2♀ 2♂; Vranja (E 5 km), 28. 05, 2008., 4♂
Parodontodynerus ephippium (Klug, 1817) – Bibinje, 3-10. 08, 2002., 1♂ (leg. Ábrahám); Cerovica (Ravni), 21. 06, 2003., 1♀ 1♂; Koromačno: Tunarica, 21. 06, 2003., 1♀; n. b. of Krk, 18. 06, 2009., 1♀; Limski kanal, 26. 06, 2004., 1♀; Marčana, 22. 06, 2003., 1♀
Rhynchium oculatum (Fabricius, 1781) – Bibinje, 3-10. 08, 2002., 1♂ (leg. Ábrahám)
Stenodynerus bluetgeni van der Vecht, 1971 – Sveta Jelena, 16. 06, 2009. , 1♂
Stenodynerus chevrieranus (Saussure, 1856) – Lovran, 26. 05, 2008., 2♀; Most-Raša, 22. 06, 2003., 2♀
Stenodynerus punctifrons (Thomson, 1874 – Baške Oštarie, 22. 06, 2007. , 1♀; Podhum, 15. 06, 2009., 1♀ 2♂
Stenodynerus steckianus (Schultess, 1897) – Golovik, 28. 05, 2008., 1♀; Senj, 18. 06, 2008., 1♂; Sveta Jelena, 25. 04, 2007., 1♂, 16. 06, 2009., 1♂
Stenodynerus xanthomelas (Herrich-Schaeffer, 1839) – Koromačno: Tunarica, 21. 06, 2003., 1♀

Masarinae
Celonites abbreviatus (Villers, 1789) – Devičić Draga, 19. 06, 2009., 4♀ 1♂; Golovik, 16. 06, 2009., 1♂; Karlobag, 19. 06, 2007., 1♀; Koromačno (E 3 km), 20. 06, 2001., 1♀; Načinovići (Zagorje), 28. 05, 2008. 1♂; Omišalj, 30. 05, 2008., 1♂; Senj, 18. 06, 2009., 7♀ 2♂; Sveti Nikola (Rakalj), 22. 06, 2001., 1♀; Tribanj Krušćica, 19. 06, 2009., 2♂; Trolokve, 23. 06, 2007., 1♀

Sphecidae
Sphecinae
Ammophila heydeni Dahlbom, 1845 – Bibinje, 21-28. 07, 2001., 1♂ (leg. Ábrahám); Devičić Draga, 19.06, 2009., 1♂; Karlobag, 18. 06, 2009. 1♀; Karojba, 17. 06, 2009., 1♀; Limski kanal, 26. 06, 2004., 1♂; Senj, 18. 06, 2009., 3♂; Sveta Jelena, 23. 06, 2003., 1♂; Sveti Nikola(Rakalj), 22. 06. 2001., 1♀; Koromačno, 20. 06, 2001., 1♂; Rijeka: Pehljin, 15. 07, 1969., 1♂
Ammophila pubescens Curtis, 1829 – Vranja (E 5 km), 28. 05, 2008., 1♂
Ammophila sabulosa (Linnaeus, 1758) – Golovik, 28. 05, 2008., 1♂; Kanfanar: Dvigrad, 27. 05, 2008., 1♂; Koromačno: Tunarica, 21. 06, 2003., 1♂; Melvice, 19. 06, 2007., 1♀; Mošćenice, 25. 04, 2007., 1♂; Njivice, 27. 04, 2007., 1♂; Stanišovi, 29. 05, 2008., 1♂
Chalybion femoratum (Fabricius, 1782) – Devičić Draga, 19. 06, 2009.,1♂; Krk, 25. 06, 2005., 1♂; Rovinjsko Selo, 27. 06, 2005., 1♀
Chalybion ommissum (Kohl, 1889) – Koromačno (E 3 km), 21. 06, 2001., 4♀; Koromačno: Tunarica, 21. 06,

2003., 1♀; Rovini, 16. 06, 2009., 1♀; Stanišovi, 29. 05, 2008., 2♀
Chilosphex argyrius (Brullé, 1833) – Brseč, 21. 06, 2003., 2♀ 7♂; Brseč (N 3 km), 18. 06, 2001., 2♀; Cavići (Zagorje), 24. 06, 2005., 2♀ 2♂; Cerovica (Ravni), 21, 06, 2003., 1♀; Kanfanar: Dvigrad, 27. 06, 2005., 1♀; Koromačno (N 3 km), 20. 06, 2001., 2♂; Pićan, 17. 06, 2009., 1♂; Radelić Draga, 19. 06, 2009., 2♂; Rovinjsko Selo, 27. 06, 2005., 2♀; Sveta Jelena, 23. 06, 2003., 1♀, 204. 06, 2005., 1♀, 15. 06, 2009., 1♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♂
Hoplammophila clypeata (Mocsáry, 1883) Cerovica (Ravni), 21. 06, 2003., 1♀ 1♂; Koromačno (N 3 km), 21, 06, 2001., 3♀ 2♂; Načinivići (Zagorje), 28. 05, 2008., 1♀; Most-Raša, 22. 06, 2003., 1♂; Vrsar, 26. 06, 2004., 1♀
Hoplammophila armata (Illiger, 1807) – Devičić Draga, 19. 06, 2009., 1♀
Isodontia mexicana (Saussure, 1867) – Bibinje, 21-28. 2001., 1♀ 2♂ (leg. Ábrahám); Brseč (N 3 km), 19. 06, 2001., 3♀ 2♂; Cavići (Zagorje), 24. 06, 2005., 1♂; Cerovica (Ravni), 21. 06, 2003., 1♀ 1♂; Funtana, 26. 06, 2004., 4♂; Gračišće, 17. 06, 2009., 2♂; Koromačno (E 3 km), 20. 06, 2001., 1♀ 1♂; Lindar, 17. 06, 2009., 2♂; Mošćenice, 15. 06, 2009., 1♂; Mošćenička Draga,. 20. 06, 2003., 1♀; Most-Raša, 22. 06, 2003., 1♂; Rovini, 15. 06, 2009., 1♂; Rovinjsko Selo, 27. 06, 2005., 1♀ 1♂; Sveta Jelena, 20. 06, 2003., 4♂; Strepčići 19. 06, 2001., 1♀ 3♂; Vrsar, 26. 06, 2004., 1♂
Isodontia paludosa (Rossi, 1790) Brsec (N 3 km), 18. 06, 2001., 2♂; Sveta Jelena, 20. 06, 2003., 2♂
Isodontia splendidula (Costa, 1858) – Radelić Draga, 19. 06, 2009., 3♂
Palmodes occitanicus (Lepeletier & Serville, 1828) – Brseč, 21. 06, 2003., 1♂; Koromačno (N 3 km), 20. 06, 2001., 1♂
Prionyx kirbyi (Vander Linden, 1827) – Bibinje, 03-10. 08, 2002., 1♂ (leg. Ábrahám)
Sceliphron curvatum (Smith, 1870) – Bibinje, 21-28. 07, 2001., 1♀ (leg. Ábrahám); Gračišće, 17. 06, 2009., 2♂; Koromačno: Tunarica, 21. 06, 2003., 1♀; Lindar, 17. 06, 2009., 1♂; Lovran, 20. 06, 2003., 2♂; Medulin, 27. 06, 2004., 1♀; Most-Raša, 22. 06, 2003., 1♀; Sveta Jelena, 23. 06, 2003., 1♀
Sceliphrom caementarium (Drury, 1773) – Bibinje, 03-10. 08, 2002., 2♀ (leg. Ábrahám); Funtana, 26. 06, 2004., 2♀ 1♂; Krk, 25. 06, 2005., 1♂; Medulin, 27. 06, 2004., 2♀; Most-Raša, 22. 06, 2003., 2♂; Rovinjsko Selo 27. 06, 2005., 2♀
Sceliphron destillatorium (Illiger, 1807) – Koromačno: Tunarica, 22. 06, 2003., 1♂; Medulin, 27. 06, 2004., 2♀
Sceliphron madraspatanum tubifex (Latreille, 1809) – Bibinje, 03-10. 08, 2002., 3♀ 1♂ (leg. Ábrahám)
Sphex rufocinctus Brullé, 1833 – Bibinje, 21-28. 07, 2001., 1♀ (leg. Ábrahám); Brseč (N 3 km), 19. 06, 2001., 1♀; Limski kanal, 26. 06, 2004., 2♀; Poličnik, 20. 06, 2007., 1♂; Rovini, 16. 06, 2009., 1♀; Sveta Jelena, 21. 06, 2003., 1♀ 1♂, 24. 06, 2005., 1♂; Sveti Vid-Miholjice, 25. 06, 2005., 1♀; Vrsar, 26. 06, 2004., 2♂

Pemphredoninae
Ammoplanus wesmaeli Giraud, 1879 – Načinivići (Zagorje), 29. 05, 2008., 1♀
Mimesa bicolor Jurine, (1807) – Mošćenice, 15. 06, 2009., 1♂
Passaloecus corniger Shuckard, 1837 – Reburići, 26. 04, 2007., 1♀
Passaloecus gracilis Curtis, 1834 – Krk, 25. 06, 2005., 1♀
Passaloecus insignis (Vander Linden, 1829) – Mošćenice, 25. 04, 2007., 1♂
Passaloecus ribauti Merisuo, 1974 – Sveta Jelena, 16. 06, 2009., 1♀; Rovini, 16. 06, 2009., 1♀
Passaloecus singularis Dahlbom, 1844 – Devičić Draga, 19. 06, 2009., 1♀
Passaloecus turionum Dahlbom, 1844 – Rovini, 28. 05, 2008., 1♀
Passaloecus vandeli Ribaut, 1952 – Mošćenice, 25. 04, 2007., 1♂; Rovini, 16. 06, 2009., 1♂
Pemphredon inornata Say, 1824 – Krk, 25. 06, 2005., 1♂; Mošćenička Draga, 20. 06, 2003., 1♂; Most-Raša, 27. 06, 2004., 1♂
Pemphredon lethifera (Shuckard, 1837) –Karlobag, 22. 06, 2007., 1♀; Klenovica, 18. 06, 2009., 1♂; Mošćenice, 25. 04, 2007., 1♀, 26. 05, 2008., 2♂; Most-Raša, 22. 06, 2003., 1♂; Senj, 18. 06, 2009., 2♀; Sveta Jelena, 23. 06, 2003., 1♀, 16. 06, 2009., 2♀
Pemphredon rugifera Dahlbom, 1844 – Stanišovi, 29. 05, 2008., 1♀
Psen exaratus (Eversmann, 1849) – Grabrk, 19. 06, 2007., 1♀
Psenulus fuscipennis (Dahlbom, 1843) – Barban, 22. 06, 2003., 1♂
Psenulus meridionalis Beaumont, 1937 – Most-Raša, 27. 06. 2004., 1♂
Psenulus pallipes (Panzer, 1798) – Mošćenice, 26. 05, 2008., 2♀; Sveta Jelena, 16. 06, 2009., 1♀ 1♂
Spilomena beata Blüthgen, 1953 – Načinivići (Zagorje), 29. 05, 2008. 1♀
Stigmus solskyi Morawitz, 1864 – Mošćenice, 25. 04, 2007., 1♂

Astatinae

Astata boops (Schrank, 1781) – Most-Raša, 22. 06, 2003., 1♀; Rovini, 25. 04, 2007., 1♂
Astata minor Kohl, 1885 – Kanfanar: Dvigrad, 27. 05, 2007., 1♂; Sveta Jelena, 28. 05, 2008., 1♂

Larrinae

Liris nigra (Fabricius, 1775) – Brseč, 25. 06, 2004., 1♂; Most-Raša, 27. 06, 2004., 1♀
Pison atrum (Spinola, 1808) – Devičić Draga, 19. 06, 2009., 2♀; Lukovo Šugarje, 19. 06, 2009., 1♀; Most-Raša, 22. 06, 2003., 1♀
Prosopigastra sp. – Tribanj Kruščica, 19. 06, 2009., 1♀
Solierella pisonoides (Saunders, 1873) – Klenovica, 18. 06, 2009., 1♀; Devičić Draga 19. 06, 2009., 1♂
Tachysphex brulli (Smith, 1856) – Kanfanar: Dvigrad, 27. 05, 2008., 1♂; Omišalj, 27., 04, 2007., 1♂
Tachysphex fulvitarsis (Costa, 1867) – Marčana, 22. 06, 2003., 1♀; Most-Raša, 22. 06, 2003., 1♂
Tachysphex incertus (Radoszkowski, 1877) – Senj, 18. 06, 2009., 1♀; Susanj, 22. 06, 2007., 1♀
Tachysphex nitidior Beaumont, 1940 – n. b. of Krk, 18. 06, 2009., 1♀; Sveti Nikola (Rakalj), 22. 06, 2001., 1♀
Tachysphex unicolor (Panzer, 1809) – Brseč (N 3 km), 19. 06, 2001., 3♀; Cavići, 24. 06, 2005., 1♂; Karlobag, 22. 06, 2007., 3♀; Načinivići (Zagorje), 29. 05, 2008., 1♀; Most-Raša, 22. 06, 2003., 1♀; Susanj, 22. 06, 2007., 1♂
Tachysphex tarsinus (Lepeletier, 1845) – Brseč (N 3 km), 19. 06, 2001., 1♂; Golovik, 16. 16, 2009., 1♀; Limski kanal, 26. 06, 2004., 1♀; Polača, 21. 06, 2007., 1♂; Sveta Jelena 15. 06, 2009., 1♂
Trypoxylon clavicerum Lepeletier & Serville, 1828 – Pićan, 17. 06, 2009., 1♂
Trypoxylon minus Beaumont, 1945 – Baške Oštarie, 22. 06, 2007., 1♂
Trypoxylon figulus (Linnaeus, 1758) – Cerovica (Ravni), 21. 06, 2003., 1♀; Most-Raša, 27. 06, 2004., 1♀

Crabroninae

Crossocerus cetratus (Shuckard, 1837) – Podhum, 15. 06, 2009., 1♀
Crossocerus elongatulus (Vander Linden, 1829) – Bibinje, 21. 06, 2007., 3♂; Mošćenice, 26. 05, 2008. 1♂
Crossocerus podagricus (Vander Linden, 1829) – Mošćenice, 26. 05, 2008., 2♂; Rovini, 15. 06, 2009. 1♀
Crossocerus vagabundus (Panzer, 1798) – Lovran, 25. 04, 2007., 1♂; Martina, 26. 04, 2007. , 1♀
Ectemnius continuus (Fabricius, 1804) – Lindar, 17. 06, 2009., 1♀; Most-Raša, 22. 06, 2003., 1♂
Ectemnius dives (Lepeletier & Brullé, 1834) – Rava Gora, 20. 06, 2003., 1♂
Entomognathus brevis (vander Linden, 1829) – Lindar, 17. 06, 2009., 1♂
Lestica clypeata (Schreber, 1759) – Koromačno, 20., 06, 2001., 1♀; Sveta Jelena, 23. 06, 2003., 3♀
Lindenius albilabris (Fabricius, 1793) – Podhum, 15. 06, 2009. 1♀; Vela Učka, 16. 06, 2009., 1♀
Lindenius laevis Costa, 1871 – Lindar, 17. 06, 2009., 3♀; Pićan, 17. 06, 2009., 1♀

Nyssoninae

Argogorytes mystaceus (Linnaeus, 1761) – Lovran, 15. 06, 2009., 1♀; Mošćenice, 26. 05, 2008., 2♀; Podhum, 15. 06, 2009., 1♀; Sveta Jelena, 26. 05, 2008. 2♀
Bembecinus tridens (Fabricius, 1781) – Labin: Dubrava, 21. 06, 2003., 1♂; Nin: beach, 20. 06, 2007., 1♀ 1♂
Bembix oculata Panzer, 1801 – Briševo, 20. 06, 2007., 1♂; Karlobag, 19. 06, 2007., 1♀; Nin: beach, 20. 06, 2007. 1♀ 1♂; Senj, 18. 06, 2009. 1♀
Gorytes foveolatus Handlirsch, 1888 – Lindar, 17. 06, 2009., 1♂
Gorytes laticinctus (Lepeletier, 1832) – Koromačno (E 3 km), 20. 06, 2001., 1♀
Gorytes planifrons (Wesmael, 181852) – Sveta Jelena, 15. 06, 2009. 1♀
Gorytes pleuripunctatus (Costa, 1859) – Brseč (N 3 km), 19. 06, 2001., 2♂
Gorytes procrustes Handlirsch, 1888 – Petehi, 22. 06, 2001., 1♂
Gorytes quinquecinctus (Fabricius, 1793) – Podhum, 15. 06, 2009., 1♂; Most-Raša, 22. 06, 2003., 1♂
Gorytes quinquefasciatus (Panzer, 1798) – Brseč (N 3 km), 19. 06, 2001., 2♂
Harpactus affinis (Spinola, 1808) – Golovik, 28. 05, 2008. 3♀; Njivice, 27. 04, 2007., 1♂; Omišalj, 27. 04, 2007., 1♂; Sveta Jelena, 25. 04, 2007., 4♂, 28. 05, 2008., 1♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♂
Harpactus consanguineus (Handlirsch, 1888) – Golovik 16. 06, 2009., 1♀
Harpactus niger Costa, 1858 – Sveta Jelena, 15. 06, 2009., 1♀ 3♂
Nysson dimidiatus Jurine, 1807 – Nin: beach, 20. 06, 2007., 1♀

Nysson fulvipes Costa, 1859 – Kanfanar: Dvigrad, 27. 06, 2005., 1♂; Nin: beach, 20. 06, 2007., 1♀
Nysson maculosus (Gmelin, 1790) – Golovik, 16. 06, 2009., 2♀; Rovini, 16. 06, 2009., 1♀
Nysson niger Chevrier, 1868 – Salakovci, 29. 05, 2008., 1♀
Nysson spinosus (Forster, 1771) – Vela Učka, 28. 05, 2008., 1♂
Psammaecius punctulatus (Vander Linden, 1829) – Gornji Poličnik, 20. 06, 2007., 7♂; Nin: beach, 20. 06, 2007., 7♂; Polača, 21. 06, 2007., 1♂
Sphecius conicus (Germar, 1817) – Rovinjsko Selo, 27. 06, 2005., 2♂

Philanthinae
Cerceris arenaria (Linnaeus, 1758) – Polača, 21. 06, 2007., 1♀ 1♂; Susanj, 22. 06, 2007., 1♀
Cerceris flavilabris (Fabricius, 1793) – Brseč (N 3 km), 19. 06, 2001., 1♂; Funtana, 26. 06, 2004., 2♂
Cerceris rybyensis (Linnaeus, 1771)- Senj, 18. 06, 2009., 1♂
Cerceris sabulosa (Panzer, 1799) – Bakarac, 23. 06, 2003., 1♀; Funtana, 26. 06, 2004., 1♂; Marčana, 22. 06, 2003., 1♂; Pićan, 17. 06, 2009., 1♂; Polača, 21. 06, 2007., 5♂; Rovinsjsko Selo, 26. 06, 2004., 1♂; Senj, 18. 06, 2009., 1♂; Susanj, 22. 06, 2007., 1♂
Cerceris specularis Costa, 1869 – Polača, 21. 06, 2007., 1♂
Philanthus triangulum (Fabricius, 1775) – Barić Draga, 22. 06, 2007., 1♀; Brseč, 21. 06, 2003., 1♂; Gornji Poličnik, 20., 06, 2007., 1♀; Karlobag, 19. 06, 2007., 1♀; Nin: beach, 20. 06, 2007., 2♂; Polača, 21. 06, 2007., 1♂; Susanj, 22. 06, 2007., 1♀

Apidae
Colletinae
Colletes gallicus Radoskowski, 1891 – Brseč (N 3 km), 18, 06, 2001., 1♀; Labin: Dubrava, 21. 06, 2003., 2♂; Lindar, 17. 06, 2009., 1♂
Colletes daviesanus Smith, 1846 – Karojba, 17. 06, 2009. 1♀;
Colletes graeffei Alfken, 1900 – Gornji Poličnik, 20. 06, 2007., 1♀
Colletes inexpectatus Noskiewicz, 1936 – Sveta Jelena, 16. 06, 2009., 1♀
Colletes lebedewi Noskiewicz, 1936 – Polača, 21. 06, 2007., 1♀
Colletes nigricans Gistel, 1857 – Karojba, 17. 06, 2009., 1♀
Colletes similis Schenck, 1853 – Karojba, 17. 06, 2009., 1♂; Sveta Jelena, 16. 06, 2009., 2♂
Colletes spectabilis Morawitz, 1868 – Stanišovi, 29. 05, 2008., 1♀
Hylaeus absolutus (Gribodo, 1894) – Sveta Jelena, 23. 06, 2003., 1♂
Hylaeus adriaticus (Warncke, 1972) – Karlobag, 22. 06, 2007., 1♀ 1♂; Klenovica, 18. 06, 2009., 1♀; Koromačno, 20. 06, 2001., 1♀; Senj, 18. 06, 2009., 1♂; Susanj, 22. 06, 2007., 1♀
Hylaeus angustatus (Schenck, 1869) – Cerovica (Ravni), 28. 04, 2007., 1♂; Donji Lopci, 19. 06, 2007., 1♀; Hreljin, 27. 04, 2007., 1♂, 30. 05, 2008., 1♂; Klenovica, 18. 06, 2009., 1♂; Lukovo Šugarje, 19. 06, 2009., 1♀ 1♂; Senj, 18. 06, 2009., 1♀ 1♂; Susanj, 22. 06, 2007., 1♂; Trolokve, 23. 06, 2007., 1♀
Hylaeus brevicornis Nylander, 1852 – Baške Oštarie, 22. 06, 2007., 1♂; Cavići (Zagorje), 25. 06, 2004., 2♂, 24. 06, 2005., 1♂; Funtana, 26. 06, 2004., 2♂; Golovik, 16. 06, 2009., 1♀; Hreljin, 30. 05, 2008., 1♂; Karlobag, 22. 06, 2007., 2♀; n. b. of Krk, 27. 04, 2007., 3♀ 2♂, 18. 06, 2009., 1♂; Lindar, 17. 06, 2009., 1♀ 1♂; Polača, 21. 06, 2007., 1♀; Modriči, 19. 06, 2007., 1♀; Mošćenička Draga, 20. 06, 2003., 1♂; Nin: beach, 20. 06, 2007., 1♂; Omišalj, 30. 05, 2008., 1♂; Most-Raša, 27. 06, 2004., 1♂; Rava Gora, 20. 06, 2003., 1♂; Rovini, 16. 06, 2009., 1♀; Rovinjsko Selo, 26. 06, 2004., 1♂; Salakovci, 29. 05, 2008., 1♂; Sveta Jelena, 24. 06, 2005., 1♂; Sveti Nikola (Rakalj), 22. 06, 2001., 1♂
Hylaeus clypearis (Schenck, 1863) – Cavići (Zagorje), 24. 06, 2005., 2♀ 1♂; Cerovica (Ravni), 23. 05, 2008., 1♂; Funtana, 26. 06, 2004., 20♀ 2♂; Gračišće, 17. 06, 2009., 3♀ 1♂; Karlobag, 19. 06, 2007., 1♀; Karojba, 17. 06, 2009., 2♀; Lindar, 17. 06, 2009., 2♂; Mošćenice, 26. 05, 2008., 2♂; Omišalj, 27. 04, 2007., 1♂; Rovini, 15. 06, 2009., 1♀; Salakovci, 29. 05, 2008., 1♀; Sveta Jelena, 16. 06, 2009., 5♀ 2♂; Sveta Katarina, 27. 05, 2008., 2♂; Sveti Nikola (Rakalj), 22. 06, 2001., 1♂
Hylaeus communis Nylander, 1852 – n. b. of Krk, 27. 04, 2007., 1♂; Mošćenice, 25. 04, 2007., 1♂, 26. 05, 2008., 2♂
Hylaeus confusus Nylander, 1852 – Bakarac, 23. 06, 2003., 1♀; Sveta Jelena, 24. 06, 2005. , 1♀; n. b. of Krk, 27. 04, 2007., 1♂; Melvice, 19. 06, 2007., 1♀; Most-Raša, 22. 06, 2003., 1♂; Sveta Jelena, 24. 06, 2005., 1♀; Vela Učka, 16. 06, 2009., 2♀ 1♂
Hylaeus difformis (Eversmann, 1852) – Donji Lopci, 19. 06, 2007., 1♀

Hylaeus duckei (Alfken, 1904) – Cerovica (Ravni), 29. 05, 2008., 1♀ 1♂; Golovik, 28. 05, 2008., 1♂; Gračišće, 17. 06, 2009., 2♂; n. b. of Krk, 27. 04, 2007., 1♂; Lindar, 17. 06, 2009., 1♂; Mošćenice, 26. 05, 2008. , 1♂; Rovini, 15. 06, 2009., 2♀ 1♂; Sveta Jelena, 24. 06, 2005., 1♂
Hylaeus euryscapus Förster, 1877 – n. b. of Krk, 18. 06, 2009., 1♀
Hylaeus gibbus Saunders, 1850 – Mošćenička Draga, 20. 06, 2003., 1♀
Hylaeus hyalinatus Smith, 1842 – Baške Oštarie, 22. 06, 2007., 1♀; Gračišće, 17. 06, 2009., 1♂
Hylaeus kahri Förster, 1871 – Rovini, 16. 06, 2009., 3♂; Sveta Jelena, 15. 06, 2009., 1♂
Hylaeus leptocephalus (Morawitz, 1870) – Rovini, 28. 05, 2008., 1♀
Hylaeus lineolatus (Schenck, 1859) – Devičić Draga, 19. 06, 2009., 1♂; Golovik, 28. 05, 2008., 1♂; Hreljin, 30. 05, 2008., 2♂; n. b. of Krk, 27. 04, 2007, 30. 05, 2008., 2♀ 4♂; Lindar, 17. 06, 2009., 1♀; Polača, 21. 06, 2007., 1♂; Rovini, 15. 06, 2009., 1♂; Starigrad-Palenica, 22. 06, 2007., 1♀ 1♂; Sveta Jelena, 15. 06, 2009., 1♀; Sveta Katarina, 27. 05, 2008., 2♀ 2♂; Trolokve, 23. 06, 2007., 1♀
Hylaeus meridionalis Förster, 1871 – Polača, 21. 06, 2007., 1♀
Hylaeus punctatus (Brullé, 1832) – Barban, 22. 06, 2003., 1♀; Cavići (Zagorje), 23. 06, 2004., 1♂; Gračišće, 17. 06, 2009., 2♀ 1♂; Golovik, 26. 05, 2008., 1♂, 16. 06, 2009., 1♀; Karlobag, 22. 06, 2007., 1♀; n. b. of Krk, 30. 05, 2008., 1♀ 1♂; Modriči, 19. 06, 2007., 1♀; Mošćenice, 26. 05, 2008., 3♀ 1♂; Polača, 21. 06, 2007., 2♀; Rovini, 15. 06, 2009., 1♀ 2♂; Starigrad-Paklenica, 22. 06, 2007., 4♂; Sveta Jelena, 16. 06, 2009., 1♀; Sveta Katarina, 27. 05, 2008., 1♂; Sveti Nikola (Rakalj), 22. 06, 2001., 1♀;
Hylaeus punctulatissimus Smith, 1842 – Cavići (Zagorje), 26. 06, 2004., 1♀ 1♂; Golovik, 15. 06, 2009., 2♀ 2♂; Labin: Dubrava, 21. 06, 2003., 1♀; 1♂; Most-Raša, 22. 06, 2003., 1♀, 27. 05, 2008., 1♂; Sveta Jelena, 15. 06, 2009., 1♂
Hylaeus signatus (Panzer, 1798) – Barić Draga, 22. 06, 2007., 1♂; Golovik, 28. 05, 2008., 1♂; Hreljin, 30. 05, 2008., 1♂; Mošćeniče, 26. 05, 2008., 2♂; Načinivići (Zagorje), 29. 05, 2008., 3♂;Rovini, 25. 04, 2007., 1♂, 15. 06, 2009., 1♀; Senj, 18. 06, 2009., 1♀ 2♂; Sveta Jelena, 24. 06, 2005., 2♂;
Hylaeus sinuatus (Schenck, 1853) – Gračišće 17. 06, 2009., 1♂; n. b. of Krk, 30. 05, 2008., 2♀
Hylaeus styriacus Förster, 1871 – Cavići (Zagorje), 25, 06, 2004., 1♂; Lindar, 17. 06, 2009.,3♂; Pićan, 17. 06, 2009., 1♂
Hylaeus variegatus (Fabricius, 1798) – Funtana, 26. 06, 2004., 1♂; Lindar, 17. 06, 2009., 1♂; Polača, 21. 06, 2007., 2♂; Susanj, 22. 06, 2007., 1♀

Andreninae

Andrena aeneiventris Morawitz, 1872 – Funtana, 26. 06, 2004., 1♀
Andrena bicolor Fabricius, 1775 – Lindar, 17. 06, 2009., 1♀; Hreljin, 27. 04, 2007., 1♀; n. b. of Krk, 30. 05, 2008., 1♀; Vrelo, 23. 06, 2007., 1♀
Andrena chrysopyga Schenck, 1853 – Cerovica (Ravni), 26. 04, 2007., 1♀; Reburići, 26. 04, 2007., 1♀; Skitača, 26. 04, 2007., 1♀
Andrena crysosceles (Kirby, 1802): - Golovik, 26. 05, 2008., 1♀
Andrena colletiformis Morawitz, 1874 – Funtana, 26. 06, 2004., 2♀
Andrena curvana Warncke, 1965 – Lindar, 17. 06, 2009., 1♀ 1♂
Andrena curvungula Thomson, 1870 – Plomin, 27. 05, 2008., 1♀
Andrena decipiens Schenck, 1859 – Cerovica (Ravni), 21. 06, 2003., 1♀; Karojba, 17. 06, 2009., 1♀; Labin: Dubrava, 21. 06, 2003., 1♀
Andrena distinguenda Schenck, 1871 – Sveta Jelena, 25. 04, 2007. 11♀; Sveta Katarina, 27. 05, 2008., 2♀
Andrena dorsalis Brullé, 1832 – Hreljin, 27. 04, 2007., 1♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♀
Andrena dorsata (Kirby, 1802) – Grabrk, 19, 06, 2007., 1♀
Andrena enslinella Stöckhert, 1924 – Mošćenice, 26. 05, 2008., 1♀
Andrena flavipes Panzer, 1799 – Gornji Poličnik, 20, 06, 2007., 1♀; Funtana, 26. 06, 2004., 2♀; Kapelica, 26. 04, 2007., 1♀; Polača, 21. 06, 2007., 1♂; Sveta Jelena, 23. 06, 2003., 1♀, 25. 04, 2007., 2♀,15. 06, 2009., 1♀
Andrena florea Fabricius, 1793 – Most-Raša, 27. 06, 2004., 1♀; Sveta Jelena, 26. 05, 2008., 3♂
Andrena floricola Eversmann, 1852 – Grabrk, 19. 06, 2007., 1♀
Andrena fulvago (Christ, 1791) – Cavići (Zagorje), 26. 06, 2004., 3♀; Donji Lopci, 19. 06, 2007., 1♀; Hreljin, 27. 04, 2007., 1♀; Lovran, 25. 04, 2007., 1♀; Matesiči, 23. 06, 2007., 1♀; Mošćenice, 25. 04, 2007., 4♂; Vrelo, 23. 06, 2007., 1♂; Vela Učka, 28. 05, 2008., 1♂
Andrena fulvicornis Schenck, 1853 – Grabrk, 19. 06, 2007., 2♂

Andrena fulvata Stöckhert, 1930 – Vela Učka, 28. 05, 2008., 1♀
Andrena gelriae van der Vecht, 1927 – Cerovica (Ravni), 26. 04, 2007., 1♂; Donji Lopci, 19. 06, 2007., 1♀; Golovik, 28. 05, 2008., 1♀; Karojba, 17. 06, 2009., 2♀; Njivice, 27. 04, 2007., 1♀; Pićan, 17. 06, 2009., 2♀; Ravni, 29. 05, 2008., 1♀; Španidiga, 27. 05, 2008., 1♀; Vrelo, 23. 06, 2007., 1♀
Andrena granulosa Pérez, 1902 – Sveta Jelena, 25. 04, 2007., 1♂
Andrena haemorrhoa (Fabricius, 1781) – Podhum, 15. 06, 2009., 2♀; Sveta Katarina, 27. 05, 2008., 1♀
Andrena hattorfiana (Fabricius, 1775) – Golovik, 28. 05, 2008., 2♂; Kanfanar: Dvigrad, 27. 06, 2005., 1♀ 1♂, 27. 05, 2008., 3♂; Pićan, 17. 06, 2009., 1♀; Podhum, 15, 06, 2009., 1♀; Rovinjsko Selo, 27. 06, 2005., 1♀; Španidiga, 27. 05, 2008., 2♂; Vela Učka, 16. 06, 2009., 1♀
Andrena helvola (Linnaeus, 1758) – Sveta Jelena, 28. 05, 2008., 1♀
Andrena hesperia Smith, 1853 – Cavići (Zagorje), 26. 06, 2004., 3♀; Omišalj, 27. 04, 2007., 1♀; Reburići, 26. 04, 2007., 1♂
Andrena humilis Imhoff, 1832 – Brovinje, 26. 04, 2007., 1♂; Cavići (Zagorje), 26. 06, 2004., 2♀; Cerovica (Ravni), 26. 04, 2007., 1♀; Golovik, 28. 05, 2008., 3♀; Kapelica, 26. 04, 2007., 3♀; Lovran, 25. 04, 2007., 1♂; Martina, 28. 05, 2008., 1♀; Mošćenice, 25. 04, 2007., 1♂; Njivice, 27. 04, 2007., 1♀; Omišalj, 30. 05, 2008., 1♀; Reburići, 26. 04, 2007., 3♀; Skitača, 26, 04, 2007., 1♀ 2♂; Sveta Jelena, 25. 04, 2007., 1♂, 28. 05, 2008., 1♀; Sveta Katarina, 27. 05, 2008., 3♀;
Andrena impunctata Pérez, 1895 – Cerovica (Ravni), 26. 04, 2007., 1♂; Sveta Katarina, 27. 05, 2008., 11♀ 1♂
Andrena jacobi Perkins, 1921 – Bakar, 27. 04, 2007., 1♀; Brseč, 25. 06, 2004., 3♂
Andrena labialis (Kirby, 1802) – Golovik, 26. 05, 2008., 1♂; Kanfanar: Dvigrad, 27. 05, 2008., 2♀; Karojba, 17. 06, 2009., 1♀; Pićan, 17. 06, 2009., 3♀ 1♂; Susanj, 22. 06, 2007., 1♀; Sveta Jelena, 26. 05, 2008., 1♀ 1♂, 28. 05, 2008., 1♀ 2♂; Vela Učka, 16. 06, 2009., 2♀
Andrena labiata Fabricius, 1781 – Hreljin, 27. 04, 2007., 1♂; Sveta Jelena, 25. 04, 2007., 1♀; Sveta Katarina, 27. 05, 2008., 2♂
Andrena lagopus Latreille, 1809 – Sveta Jelena, 25. 04, 2007., 6♀
Andrena lathyri Alfken, 1899 – Lovran, 25. 04, 2007., 2♂
Andrena minutula (Kirby, 1802) – Donji Lopci, 19. 06, 2007., 4♀; Lindar, 17. 06, 2009., 2♀; Melvice, 19. 06, 2007., 1♀; Omišalj, 30. 05, 2008., 1♂; Pićan, 17. 06, 2009., 1♀; Ravni, 29. 05, 2008., 1♂; Reburići, 26, 04, 2007. 1♀
Andrena minutuloides Perkins, 1914 – Baške Oštarie, 22. 06, 2007., 2♀; Fužine, 30. 05, 2008., 2♀; Podhum, 15. 06, 2009., 3♀; Vela Učka, 28. 05, 2008., 1♀
Andrena mocsaryi Schmiedeknecht, 1883 – Cerovica (Ravni), 26. 04, 2007., 1♀
Andrena morio Brullé, 1832 – n. b. of Krk, 30. 05, 2008., 1♂
Andrena nigroaenea (Kirby, 1802) – Lovran, 25. 04, 2007., 1♂; Mošćenice, 26. 05, 2008., 2♂
Andrena nigroolivacea Dours, 1873 – Kapelica, 26. 04, 2007., 1♀
Andrea niveata Friese, 1887 – Rovinj: Borik, 27. 05, 2008., 1♀
Andrena ovatula (Kirby, 1802) – Golovik, 29. 05, 2008., 2♀; Kanfanar: Dvigrad, 27. 05, 2008., 3♀; Lovran, 26. 05, 2008., 1♀; Rovinj: Borik, 27. 05, 2008., 1♀; Sveta Jelena, 26. 05, 2008., 1♂
Andrena pandellei Pérez, 1895 – Golovik, 26. 05, 2008. 1♂; Kanfanar: Dvigrad, 27. 05, 2008., 1♀; Martina, 28. 05, 2008., 1♀; Sveti Vid-Miholjice, 27. 04, 2007., 3♂; Vela Učka, 16. 06, 2009., 2♀; Vrelo, 23. 06, 2007., 1♀
Andrena paucisquama Noskiewicz, 1924 – Golovik, 26. 05, 2008., 1♀; Martina, 16. 06, 2009., 1♀; Sveta Katarina, 27. 05, 2008., 1♀; Vrelo, 23. 06, 2007., 3♀
Andrena proxima (Kirby, 1802) – Cerovica (Ravni), 26, 04, 2007., 4♀, 29. 05, 2008., 1♀; Fužine, 30. 05, 2008., 1♀; Mošćenice, 26. 05, 2008., 1♀; Vela Učka, 28. 05, 2008., 4♀
Andrena saxonica Stöckhert, 1935 – Hreljin, 27. 04, 2007., 1♀; Omišalj, 27. 04, 2007., 1♀; Sveta Jelena, 25. 04, 2007., 1♂; Sveta Katarina, 27. 05, 2008., 3♀
Andrena schletterei Friese, 1896 – Sveta Katarina, 27. 05, 2008., 7♀
Andrena similis Smith, 1849 – Lovran, 25. 04, 2007., 1♀
Andrena simontornyella Noskiewicz, 1939 – Bakar, 27. 04, 2007., 1♀; Cerovica (Ravni), 26. 04, 2007., 7♀, 29. 05, 2008., 4♀; Mošćenice, 25. 04, 2007., 1♀; Lindar, 17. 06, 2009., 2♀; Omišalj, 27. 04, 2007., 1♀; Skitača, 26. 04, 2007., 2♀; Sveta Jelena, 25. 04, 2007., 2♀, 28. 05, 2008., 1♀
Andrena subopaca Nylander, 1848 – Podhum, 26. 05. 2008., 1♀, 15. 06, 2009., 2♀
Andrena susterai Alfken, 1914 – Reburići, 26. 04, 2007., 1♀

Andrena thoracica (Fabricius, 1775) – Brseč (N 3 km), 18. 06, 2001., 1♀; Podhum, 15. 06, 2009., 1♀; Sveta Jelena, 16. 06, 2009., 1♀
Andrena tibialis (Kirby, 1802) – Sveta Katarina, 27. 05, 2008., 1♀
Andrena truncatilabris Morawitz, 1877 – Rovinj: Borik, 27. 05, 2008., 1♀; Rovinjsko Selo, 27. 05, 2008., 1♀
Andrena wilkella (Kirby, 1802) – Golovik, 26. 05, 2008., 1♂; Lovran, 26. 05., 2008., 5♂

Halictinae
Halictus asperulus Pérez, 1895 – Polača, 21, 06, 2007., 1♂; Senj, 18. 06, 2009., 1♀; Tribanj Krušćica, 19. 06, 2009. 1♀
Halictus brunnescens (Eversmann, 1852) – Mošćenice, 20. 06, 2003., 1♀; Sveti Nikola (Rakalj), 22. 06, 2001., 1♀ 1♂
Halictus fulvipes (Klug, 1817) – Bakar, 27. 04, 2007., 2♀; Barić Draga, 22. 06, 2007., 1♀; Briševo, 20. 06, 2007., 1♀; Gornji Poličnik, 20. 06, 2007., 2♀; Bibinje, 21-28. 07, 2001., 2♀ (leg. Ábrahám), 3-10. 08, 2002., 1♀ (leg. Ábrahám); Karlobag, 18. 06, 2009., 1♂; Koromačno, 20. 06, 2001., 2♀; n. b. of Krk, 18. 06, 2009., 1♀; Lukovo Šugarje, 19. 06, 2009., 1♂; Matesiči, 23. 06, 2007., 1♀; Modriči, 19. 06, 2007., 2♀; Polača, 21. 06, 2007. 1♀; Radelić Draga, 19. 06, 2009., 2♀; Sveti Nikola (Rakalj), 22. 06, 2001., 1♀; Tribanj Krušćica, 19. 06, 2009., 3♀;
Halictus gemmeus Dours, 1872 – Gorica, 21. 06, 2007. 1♀
Halictus kessleri Bramson, 1879 – Hreljin, 30. 05, 2008., 1♀; Karlobag, 22. 06, 2007., 1♂; Klenovica, 18. 06, 2009., 1♀ 1♂; Modriči, 19. 06, 2007., 4♀; n. b. of Krk, 18. 06, 2009., 1♀; Rovinjsko Selo, 27. 05, 2008., 2♀; Senj, 18. 06, 2009. 6♀ 1♂
Halictus langobardicus Blüthgen, 1944 – Barić Draga, 22. 06, 2007., 3♀; Baške Oštarie, 22. 06, 2007., 1♀; Brseč, 21. 06, 2003., 1♀; Hreljin, 27. 04, 2007., 1♀; Klenovica, 18. 06, 2009., 1♂; Koromačno, 20. 06, 2001., 1♀; n. b. of Krk, 30. 05, 2008., 2♀; Lovran, 25. 04, 2007. 1♀, 26. 05, 2008., 2♀, 15. 06, 2009., 1♀; Lukovo Šugarje, 19. 06, 2009., 1♂; Martina, 28. 05, 2008., 2♀; Modriči, 19. 06, 2007., 1♀; Mošćenice, 26. 05, 2008., 2♀; Most-Raša, 27. 06, 2004., 1♀; Rovini, 28. 05, 2008., 1♀; Rovinjsko Selo, 27. 05, 2008., 1♀; Salakovci, 29. 05, 2008., 1♀; Susanj, 22. 06, 2007., 2♀; Sveta Jelena, 25. 04, 2007., 2♀; Trolokve, 23. 06, 2007., 2♀; Vela Učka, 28. 05, 2008., 2♀; Vranja (E 5 km), 28. 05, 2008., 1♀
Halictus maculatus Smith, 1848 – Cerovica (Ravni), 21. 06, 2003., 1♀, 26. 04, 2007., 1♀; Kanfanar: Dvigrad, 27. 05, 2008., 1♀; Podhum, 26. 05, 2008., 2♀; Susanj, 22. 06, 2007., 1♂
Halictus patellatus Morawitz, 1873 – Cerovica (Ravni), 21. 06, 2003., 1♂; Golovik, 16. 06, 2009., 1♀; Karojba, 17. 06, 2009., 1♀; Sveta Jelena, 25. 04, 2007., 1♀; Susanj, 22. 06, 2007., 1♂
Halictus pollinosus Sichel, 1860 – Barić Draga, 22. 06, 2007., 1♂; Kakma, 21. 06, 2007., 1♀; Klenovica, 18. 06, 2009., 1♀; n. b. of Krk, 30. 05, 2008., 1♀
Halictus quadricinctus (Fabricius, 1776) – n. b. of Krk, 31. 05, 2008., 1♀; Prešika, 21. 06, 2003., 1♂; Radelić Draga, 19. 06, 2009., 1♀; Rovinjsko Selo, 27. 06, 2005., 1♂; Susanj, 22. 06, 2007., 1♀; Sveta Jelena, 24. 06, 2005., 1♀; Sveti Nikola (Rakalj), 22. 06, 2001., 1♀; Vela Učka, 16. 06, 2009., 2♀ 1♂;
Halictus rubicundus (Christ, 1791) – Grabrk, 19. 06, 2007., 1♀
Halictus scabiosae (Rossi, 1790) – Klenovica, 18. 06, 2009., 1♂; n. b. of Krk, 30. 05, 2008., 2♀, 18. 06, 2009. , 1♀; Labin: Dubrava, 21. 06, 2003., 1♀; Matesiči, 23. 06, 2007., 1♀; Prešika, 21. 06, 2003., 1♀ 1♂; Radelić Draga, 19. 06, 2009., 2♂; Most-Raša, 27. 05, 2008., 1♀; Reburići, 26. 04, 2007., 1♀; Rovini, 26. 05, 2008., 1♀; Senj, 18. 06, 2009., 1♀; Sveta Jelena, 23. 06, 2003., 1♀;
Halictus seladonius (Fabricius, 1794) – Susanj, 22. 06, 2007., 1♀
Halictus sexcinctus (Fabricius, 1775) – Bakar, 27. 04, 2007., 1♀; Pićan, 17. 06, 2009., 1♀
Halictus simplex Blüthgen, 1923 – Grabrk, 19. 06, 2007., 2♀; Polača, 21. 06, 2007., 1♀; Rijeka: Pehljin, 16. 07, 1969., 8♀
Halictus smaragdulus Vachal, 1895 – Karlobag, 19, 06, 2007., 1♀; n. b. of Krk, 18. 06, 2009., 2♀
Halictus subauratus (Rossi, 1792) – Karojba, 17. 06, 2009., 1♀; Marčana, 22. 06, 2003., 1♀; Most-Raša, 27. 06, 2004., 1♀
Halictus tumulorum (Linnaeus, 1758) – Fužine, 30. 05, 2008., 1♀; Podhum, 26. 05, 2008., 1♀, 15. 06, 2009., 1♀; Vela Učka, 28. 05, 2008., 1♀
Lasioglossum aegyptiellum dalmaticum Ebmer, 1970 – Rovinjsko Selo, 27. 05, 2008. 1♀
Lasioglossum aeratum (Kirby, 1802) – Lukovo Šugarje, 19. 06, 2009., 1♂; Senj, 18. 06, 2009., 1♀
Lasioglossum albipes (Fabricius, 1781) – Bakar, 27. 04, 2007., 2♀; Baške Oštarie, 22. 06, 2007., 1♀; Cerovica

(Ravni), 26. 04, 2007., 2♀; Kanfanar: Dvigrad, 27. 05, 2008., 1♀; Martina, 26. 04, 2007., 1♀; Matesiči, 23. 06, 2007., 1♀; Melvice, 19. 06, 2007., 1♀; Reburići, 26. 04, 2007. 2♀; Sveta Jelena, 26. 05, 2008., 1♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♀; Vela Učka, 16. 06, 2009., 1♀; Vranja (E 5 km), 28. 05, 2008., 1♀

Lasioglossum angusticeps (Perkins, 1895) – Baške Oštarie, 22. 06, 2007., 1♂

Lasioglossum bischoffi (Blüthgen 1931) – Cerovica (Ravni), 26. 04, 2007., 1♀; Lovran, 25. 04, 2007., 4♀, 26. 05, 2008., 1♀; Mošćenice, 26. 05, 2008., 1♀;Reburići, 26, 04, 2007., 2♀; Ravni, 29. 05, 2008., 1♀; Rovini, 28. 05, 2008., 1♀; Sveta Jelena, 25. 04, 2007., 3♀

Lasioglossum calceatum (Scopoli, 1763) – Bakar, 27. 04, 2007., 1♀; Grabrk, 19. 06, 2007., 3♀; n. b. of Krk, 30. 05, 2009., 1♀; Podhum, 15. 06, 2009., 1♀

Lasioglossum clypeare (Schenck, 1853) – Barić Draga, 22. 06, 2007., 1♀

Lasioglossum convexiusculum (Schenck, 1853) – Golovik, 28. 05, 2008., 1♀; Mošćenice, 26., 05, 2008., 1♀

Lasioglossum corvinum (Morawitz, 1878) – Lindar, 17. 06, 2009., 1♀; Pićan, 17. 06, 2009., 2♀; Sveta Jelena, 15. 06, 2009., 4♀

Lasioglossum costulatum (Kriechbaumer, 1873) – n. b. of Krk, 30. 05, 2008. 1♀; Martina, 16. 06, 2009., 1♀

Lasioglossum crassepunctatum (Blüthgen, 1923) – Kanfanar: Dvigrad, 27. 06, 2005., 1♂; Trolokve, 23. 06, 2007., 2♀

Lasioglossum glabriusculum (Morawitz, 1872) – Cerovica (Ravni), 21. 06, 2003., 1♀; Krk, 25. 06, 2005., 1♀ 2♂; Lukovo Šugarje, 19. 06, 2009., 1♂; Martina, 16. 06, 2009., 1♀; Rovini, 15. 06, 2009., 1♀; Rovinjsko Selo, 27. 06, 2005., 1♀; Tribanj Krusćica, 19. 06, 2009., 1♀

Lasioglossum griseolum (Morawitz, 1872) – n. b. of Krk, 18, 06, 2009., 1♂; Rovini, 16. 06, 2009., 1♀

Lasioglossum interruptum opacum (Pérez, 1895) – Baške Oštarie, 22. 06, 2007., 1♀; Briševo, 20. 06, 2007., 1♀; Brseč (N 3 km), 18. 06, 2001., 3♀; Cavići (Zagorje), 26. 06, 2004., 1♀, 24. 06, 2005., 1♀; Golovik, 26. 05, 2008., 1♀, 15.06, 2009., 1♀; Hreljin, 30. 05, 2008., 1♀; Kakma, 21. 06, 2007., 2♀; Kanfanar: Dvigrad, 27. 06, 2005., 4♀; Koromačno, 20. 06, 2001., 3♀; Limski kanal, 26. 06, 2004., 1♀; Melvice, 19. 06, 2007., 1♀; Modriči, 19. 06, 2007. 2♀; Pićan, 17. 06, 2009., 1♀; Radelić Draga, 19. 06, 2009., 3♀; Most-Raša, 22. 06, 2003., 3♀; Rijeka: Pehljin, 16. 07, 1969., 2♀; Rovini, 15. 06, 2009., 1♀ 1♂; Rovinjsko Selo, 27 06, 2005., 1♀; Senj, 18. 06, 2009., 1♀; Susanj, 27. 06, 2007., 2♀; Strepčići, 19. 06, 2001., 2♀; Sveta Jelena, 20. 06, 2003., 2♀, 24. 06, 2005., 1♀,. 04, 2007., 2♀; Trolokve, 23. 06, 2007., 1♀

Lasioglossum laevigatum (Kirby, 1802) – Cerovica (Ravni), 26. 04, 2007., 1♀; Sveta Jelena, 26. 05, 2008., 1♀

Lasioglossum laeve (Kirby, 1802) – Vela Učka, 16. 06, 2009., 4♂

Lasioglossum laticeps (Schenck, 1869) – Brseč, 25,. 06, 2004., 1♀; Cavići (Zagorje), 25. 06, 2004., 1♀; Gornji Poličnik, 20. 06, 2007., 1♀; Koromačno, 20. 06, 2001., 1♀; Melvice, 19, 06, 2007., 1♀; Sveta Jelena, 22. 06, 2003., 1♀

Lasioglossum laterale (Brullé, 1832) – Sveta Jelena, 25. 04, 2007., 1♀

Lasioglossum leucopus (Kirby, 1802) – Podhum, 15. 06, 2009., 1♀

Lasioglossum leucozonium (Scrank, 1781) – Cavići (Zagorje), 26. 06, 2004., 2♀; Golovik, 28. 05, 2008., 2♀; Gornji Poličnik, 20. 06, 2007., 1♀; Koromačno, 20. 06, 2001., 1♀; Martina, 16. 06, 2009., 1♀; Melvice, 19. 06, 2007., 2♀; Rovinjsko Selo, 27. 06, 2005., 2♂; Sveta Katarina, 27. 05, 2008., 2♀

Lasioglossum majus (Nylander, 1852) – Podhum, 15. 06, 2009., 1♀

Lasioglossum malachurum (Kirby, 1802) – Bibinje, 21-28. 07, 2001., 1♂ (leg. Ábrahám); Gornji Poličnik, 20. 06, 2007., 2♀; Martina, 28. 05, 2008., 1♀; Rovinjsko Selo, 27. 05, 2008., 1♀; Vela Učka, 16. 06, 2009. 1♀

Lasioglossum marginatum (Brullé, 1832) – Reburići, 26. 04, 2007., 2♀

Lasioglossum marginellum (Schenck, 1853) – Radelić Draga, 19. 06, 2009., 1♀; Trolokve, 23. 06, 2007. 3♀

Lasioglossum mesosclerum (Pérez, 1903) – Most-Raša, 27. 06, 2004., 1♀

Lasioglossum minutissimum Kirby, 1802) – Golovik, 16. 06, 2009., 1♂

Lasioglossum morio (Fabricius, 1793) – Cavići (Zagorje), 26. 06, 2004., 2♀, 28. 06, 2005., 1♀; Kanfanar: Dvigrad, 27. 05, 2008., 1♀; Kraljevica, 27. 04, 2007., 1♀; Polača, 21. 06, 2007., 1♀

Lasioglossum nigripes (Lepeletier, 1841) – Bakar, 27. 04, 2007., 2♀; Brseč, 21. 06, 2003., 2♀; Gornji Dobra, 21. 06, 2003., 1♀; Funtana, 26. 06, 2004., 1♀; Martina, 28. 05, 2008., 1♀; Most-Raša, 22. 06, 2003., 1♀; Rovini, 28. 05, 2008., 1♀; Reburići, 26, 04, 2007., 1♀; Sveta Jelena, 28. 05, 2008., 1♀; Sveta Katarina, 27. 05, 2008., 1♀

Lasioglossum nitidulum (Fabricius, 1804) – Karlobag, 22. 06, 2007., 1♀; n. b. of Krk, 18. 06, 2009., 1♀; Koromačno, 20. 06, 2001., 1♂; Mošćenice, 15. 06, 2009., 2♀; Rovini, 28. 05, 2008., 1♀; Susanj, 22. 06, 2007., 1♀; Trolokve, 23. 06, 2007., 1♀

Lasioglossum pallens (Brullé, 1832) – Martina, 26. 04, 2007., 1♀; Rovini, 26. 05, 2008. 1♀
Lasioglossum pauxillum (Schenck, 1853) – Golovik, 16. 06, 2009., 1♀; n. b. of Krk, 18. 06, 2009., 1♀; Podhum, 15. 06, 2009., 5♀; Vrelo, 23. 06, 2007., 1♀
Lasioglossum peregrinum (Blüthgen, 1923) – Golovik, 28. 05, 2008., 1♀
Lasioglossum politum (Schenck, 1853) – Barban, 22. 06, 2003., 1♀; Donji Lopci, 19. 06, 2007., 2♀; Kanfanar: Dvigrad, 27. 05, 2008., 1♀; Lovran, 26. 05, 2008., 1♀, 15. 06, 2009., 1♀; Matesiči, 23. 06, 2007., 1♀; Modriči, 19. 06, 2007., 2♀; Sveta Jelena, 20. 06, 2003., 1♀, 16. 06, 2009., 1♀
Lasioglossum pseudocaspicum (Blüthgen, 1923) – Koromačno (E 3 km), 20. 06, 2001., 1♀
Lasioglossum punctatissimum (Schenck, 1853) – Lovran, 25. 04, 2007, 1♀; Sveta Jelena, 25, 04, 2007. ,1♀; Vranja (E 5 km), 28. 05, 2008., 1♀
Lasioglossum puncticolle (Morawitz, 1872) – Cavići (Zagorje), 26, 06, 2004., 2♀; Lovran, 25. 04, 2007., 1♀; Martina, 16. 06, 2009., 2♀; Ravni, 29. 05, 2008., 1♀; Sveta Jelena, 28. 05, 2008., 1♀; Sveta Katarina, 27. 05, 2008., 1♀
Lasioglossum pygmaeum (Schenck, 1853) – Baške Oštarie, 22. 06, 2007., 1♀; Brseč, 21. 06, 2003., 1♀; Cavići (Zagorje), 26. 06, 2004., 1♀; Donji Lopci, 19. 06, 2007. 1♀; Gornji Poličnik, 20. 06, 2007., 1♀; Lovran, 25, 04, 2007., 1♀; Radelić Draga, 19. 06, 2009., 1♀
Lasioglossum semilucens (Alfken, 1914) – Omišalj, 27. 04, 2007., 1♀; Podhum, 15. 06, 2009., 1♀; Trolokve, 23. 06, 2007., 1♀
Lasioglossum transitorium (Schenck, 1868) – Brseč (N 3 km), 18. 06, 2001., 1♀
Lasioglossum tricinctum (Schenck, 1874) – Hreljin, 27. 04, 2007., 1♀
Lasioglossum truncaticolle (Morawitz, 1878) – Barić Draga, 22. 06, 2007., 1♀; Kakma, 21. 06, 2007., 1♀; Kanfanar: Dvigrad, 27. 06, 2005., 1♀; Karlobag, 18. 06, 2009., 1♀; Lukovo Šugarje, 19. 06, 2009., 2♀; Rijeka: Pehljin, 217. 07., 1969., 3♀; Senj, 18. 06, 2009., 1♀
Lasioglossum villosulum (Kirby, 1802) – Brovinje, 26, 04, 2007., 1♀; Golovik, 28. 05, 2008., 1♀; Gornji Poličnik, 20. 06, 2007., 1♀; Kakma, 21. 06, 2007., 1♀; Kapelica, 26. 04, 2007., 2♀; Podhum, 26. 05, 2008., 1♀, 15. 06, 2009., 1♀; Most-Raša, 27. 06, 2004., 1♂; Skitača, 26. 04, 2007., 1♀; Sveta Katarina, 27. 05, 2008., 3♀
Lasioglossum xanthopus (Kirby, 1802) – Cerovica (Ravni), 26. 04, 2007., 1♀; Kanfanar: Dvigrad, 27. 05, 2008., 1♀; Reburići, 26. 04, 2007., 1♀; Skitača, 26, 04, 2007., 1♀; Sveta Jelena, 25. 04, 2007., 4♀; Sveta Katarina, 27. 05, 2008., 1♀
Pseudapis diversipes (Latreille, 1806) – Brseč (N 3 km), 19. 06, 2001., 1♀; Gornji Poličnik, 20. 06, 2007., 1♂; Radelić Draga, 19. 06, 2009., 1♀; Rovinjsko Selo, 27. 06, 2005., 1♀; Senj, 18. 06, 2009., 2♂; Susanj, 21., 06, 2007., 1♀; Sveta Jelena, 15. 06, 2009., 1♂; Vrsar, 26, 06, 2004., 1♂
Rhophiptoides canus (Eversmann, 1852) – Vrelo, 23. 06, 2007., 1♂
Sphecodes albilabris (Fabricius, 1793) – Rovini, 26, 05, 2008., 1♀; Susanj, 22. 06, 2007., 1♀; Vranja (E 5 km), 28, 05, 2008., 1♀
Sphecodes alternatus Smith, 1853 – Polača, 21. 06, 2007., 1♂
Sphecodes cephalotes Meyer, 1922 – Polača, 21. 06, 2007., 1♂
Sphecodes croaticus Meyer, 1922 – Lovran, 25. 06, 2007., 1♀; Rovini, 15. 06, 2009., 6♀
Sphecodes ephippius (Linnaeus, 1767) – Funtana, 26, 06, 2004., 1♂; Lovran, 26. 05, 2008., 1♀; Sveta Jelena, 25. 04, 2007., 1♀
Sphecodes ferruginatus Hagens, 1882 – Gornji Jelenje, 23, 06, 2003., 1♂
Sphecodes gibbus (Linnaeus, 1758) – Cerovica (Ravni), 26. 04, 2007., 1♀; Golovik, 28. 05, 2008., 1♀, 16. 06, 2009., 2♀; Karojba, 17. 06, 2007., 1♂; n. b. of Krk, 27. 04, 2007., 1♀; Polača, 21. 06, 2007., 2♂; Rovini, 25. 04, 2007., 1♀, 15. 06, 2009., 2♀; Senj, 18. 06, 2009., 1♀; Susanj, 22. 06, 2007., 1♀
Sphecodes miniatus Hagens, 1882 – Lovran, 26. 05, 2008., 1♀; Rovini, 26. 05, 2008., 1♀
Sphecodes monilicornis (Kirby, 1802) – Cerovica (Ravni), 29. 05, 2008., 1♀; Most-Raša, 27. 05, 2008., 1♀; Rovinjsko Selo, 27. 05, 2008., 1♀
Sphecodes puncticeps Thomson, 1870 – Stanišovi, 29. 05, 2008., 1♀
Sphecodes spinulosus Hagens, 1875 – Sveta Jelena, 24. 06, 2004., 1♀

Melittinae
Macropis fulvipes (Fabricius, 1804) – Podhum, 15. 06, 2009., 1♂

Megachilidae

Anthidium affine Morawitz, 1873 – Briševo, 20. 06, 2007., 1♂; Gornji Poličnik, 20., 06, 2007., 1♂; Prešika, 21. 06, 2003., 1♀ 2♂

Anthidium cingulatum Latreille, 1809 – Most-Raša, 22. 06, 2003., 1♀

Anthidium grohmanni Spinola, 1838 – Bibinje, 3-10. 08, 2002., 1♂ (leg. Ábrahám)

Anthidium florentinum ((Fabricius, 1775) – Karlobag, 18. 06, 21009., 1♂; Most-Raša, 22. 06, 2003., 1♂

Anthidium loti Perris, 1852 – Lukovo Šugarje, 19. 06, 2009., 1♀ 3♂; Matesiči, 23. 06, 2003., 1♂; Mošćenička Draga, 20. 06, 2003., 2♀ 2♂; Prešika, 21. 06, 2003., 2♂; Senj, 18. 06, 2009., 1♂; Susanj, 22.06, 2007., 1♂; Sveta Jelena, 20. 06, 2003., 2♀; Tribanj Krusćica, 19. 06, 2009., 1♀ 1♂

Anthidium manicatum (Linnaeus, 1758) – Barić Draga, 22. 06, 2007., 1♀; Brseč, 25. 06, 2005., 1♀; Cavići (Zagorje), 28. 06, 2004., 1♀, 26. 06, 2005., 1♂; Koromačno, 20. 06, 2001., 1♀; Matesiči, 23. 06, 2007., 1♂; Mošćenice, 20. 06, 2003., 1♂; Prešika, 21. 06, 2003., 1♂; Most-Raša, 22. 06, 2003., 1♂; Rovinjsko Selo, 26. 06, 2004., 1♂; Susanj, 22. 06, 2007., 1♀ 1♂; Tribanj Krusćica, 19. 06, 2009., 1♀; Trolokve, 23. 06, 2007., 1♂

Anthidium oblongatum (Illiger, 1806) –Brseč, 25. 06, 2004., 2♂; Karojba, 17. 06, 2009., 1♀ 2♂; Petehi, 22. 06, 2001., 1♀ 1♂; Sveta Jelena, 21. 06, 2003., 1♂

Anthidium punctatum Latreille, 1809 – Donji Lopci, 19. 06, 062007., 1♂; Kanfanar: Dvigrad, 27. 06, 2005., 1♀; Lindar, 17. 06, 2009., 2♀; Rijeka: Pehljin, 16. 07, 1969., 3♂; Sveta Jelena, 24. 06, 2005., 1♂

Anthidium scapulare Latreille, 1809 – Krk, 25. 06, 2005., 1♂;n. b. of Krk, 18. 06, 2009., 1♀; Lindar, 17. 06, 2009., 2♀; Lukovo Šugarje, 19. 06, 2009., 1♂; Polača, 21. 06, 2007., 1♀; Vrelo, 23. 06, 2007., 1♀

Anthidium septemdentatum Latreille, 1809 – Brovinje, 26. 04, 2007., 1♂; Brseč, 21. 06, 2003., 4♀ 1♂; Cavići (Zagorje), 25. 06, 2004., 1♂, 24. 06, 2005., 2♂; Devićic Draga, 19. 06, 2009. 1♂; Gornji Poličnik, 20. 06, 2007., 1♂; Gračišće, 17. 06, 2009., 1♀; Koromačno (E 3 km), 21. 06, 2001, 1♀ 2♂; Labin: Dubrava, 21. 06, 2003., 1♀; Kakma, 21. 06, 2007., 1♀; Kanfanar: Dvigrad, 27. 06, 2005., 1♀; Karlobag, 22. 06, 2007., 1♀; Mošćenice, 15. 06, 2009., 1♀ 1♂; Nin: beach, 20. 06, 2007., 1♂; Pićan, 17. 06, 2009., 2♂; Plomin, 19. 06, 2001., 1♀ 1♂; Most-Raša, 22. 06, 2003., 1♂; Senj, 18. 06, 2009., 1♂; Skitača, 26. 04, 2007., 1♀; Strepčići, 19. 06, 2001., 2♂; Susanj, 22. 06, 2007., 1♀; Sveta Jelena, 25. 04, 2007., 1♀; 21. 06, 2003., 1♀, 16. 06, 2009., 3♂; Sveti Vid-Miholjice, 27. 04, 2007., 1♂; Vela Učka, 16. 06, 2009., 1♂

Anthidium strigatum (Panzer, 1805) – Briševo, 20. 06, 2007., 1♂; Cerovica (Ravni), 21. 06, 2003., 1♂; Devićic Draga, 19. 06, 2009., 1♂; Donji Lopci, 19. 06, 2007., 2♂; Golovik, 16. 06, 2009., 1♂; Karlobag, 22. 06, 2007., 1♂; Klenovica, 18. 06, 2009., 2♀; Koromačno, 20. 06, 2001., 1♀ 1♂; Koromačno: Tunarica, 22. 06, 2003., 1♂; Krk, 25. 06, 2005., 1♂; Matesči, 23. 06, 2007., 2♂; Modriči, 19. 06, 2007., 1♂; Poreč, 17. 07, 1969. 1♂; Most-Raša, 22. 06. 2003., 1♂, 27. 06, 2004., 1♂; Rijeka: Pehljin, 16. 07, 1969., 4♀ 3♂; Senj, 18. 06, 2009., 2♂; Susanj, 22. 06, 2007., 2♂; Tribanj Krušćica, 19. 06, 2009., 1♂

Anthidium undulatum Dours, 1873 – Krk, 25. 06, 2005., 1♂; Polača, 21. 06, 2007., 1♂

Chelostoma campanularum (Kirby, 1802) – Donji Lopci, 19. 06, 2007., 1♂; Rava Gora, 20. 06, 2003., 1♂; Sveta Jelena, 15. 06, 2009., 1♀

Chelostoma distinctum (Stöckhert, 1929) – Kanfanar: Dvigrad, 27. 05, 2008., 1♂; Klenovica, 18. 06, 2009., 1♀; Ravni, 29. 05, 2008., 2♂; Španidiga, 27. 05, 2008., 1♂; Sveta Jelena, 16. 06, 2009., 2♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♂; Vrelo, 23. 06, 2007., 1♂

Chelostoma emarginatum (Nylander, 1856) – Kanfanar: Dvigrad, 27. 05, 2008., 1♀; Kapelica, 26. 04, 2007., 1♀; Martina, 26. 04, 2007., 1♀; Skitača, 26. 04, 2007., 1♀

Chelostoma florisomne (Linnaeus, 1758) – Cerovica (Ravni), 26. 04, 2007., 1♀; Kanfanar: Dvigrad, 29. 05, 2008. 2♀; Podhum, 26. 05, 2008., 1♂

Chelostoma mocsaryi Schletterer, 1889 – Sveta Katarina, 27. 05, 2008., 1♂

Chelostoma rapunculi (Lepeletier, 1841) – Baške Oštarie, 22. 06, 2007., 1♂; Senj, 18. 06, 2009., 1♀; Susanj, 22. 06, 2007., 1♀; Vela Učka, 16. 06, 2009., 1♂

Chelostoma styriacum Schwarz & Gusenleitner, 1999 – Brseč, 25. 06, 2004., 1♀; Donji Lopci, 19. 06, 2007. 1♂; Karlobag, 18. 06, 2009., 1♀

Coelioxys afra Lepeletier, 1841 – Donji Lopci, 19. 06, 2007., 1♂; Golovik, 16. 06, 2009., 1♀; Marčana, 22. 06, 2003., 4♂; Načinivići (Zagorje), 29. 05, 2008., 1♂; Sveta Jelena, 23. 06, 2003., 1♂, 15. 06, 2009., 1♂; Tribanj Krušćica, 19. 06, 2009., 1♀

Coelioxys haemorrhoa Förster, 1853 – Klenovica, 18. 06, 2009., 1♂; Senj, 18. 06, 2009., 1♂

Coelioxys inermis (Kirby, 1802) – Most-Raša, 22. 06, 2003., 1♀

Coelioxys obtusa Pérez, 1884 – Devičić Draga, 19. 06, 2009., 1♀; Rijeka: Pehljin, 16. 07, 1969., 4♀

Coelioxys quadridentata (Linnaeus, 1758) – Golovik, 28. 05, 2008., 1♀
Heriades crenulatus Nylander, 1856 – Barić Draga, 22. 06, 2007. 3♀; Cavići (Zagorje), 25. 06, 2004., 1♀ 1♂; Devičić Draga, 19. 06, 2009., 1♂; Funtana, 26. 06, 2004., 1♀; Gornji Poličnik, 20. 06, 2007., 2♀; Karlobag, 19. 06, 2007. 1♂; Klenovica, 18. 06, 2009., 1♂; Krk, 25. 06, 2005., 1♂; n. b. of Krk, 18. 06, 2009., 1♂; Lukovo Šugarje, 19. 06, 2009., 2♂; Mošćenička Draga, 20. 06, 2003., 1♀ 2♂; Nin: beach, 20. 06, 2007., 1♂; Polača, 21. 06, 2007., 1♀; Radelić Draga, 19. 06, 2009., 2♂; Most Raša, 27. 06, 2004., 1♂; Senj, 18. 06, 2009., 1♂; Susanj, 22. 06, 2007., 1♂; Sveti Nikola (Rakalj), 22. 06, 2001., 1♂; Tribanj Kruščica, 19. 06, 2009., 4♂
Heriades rubicolus Pérez, 1890 – Lovran, 15. 06, 2009., 1♂; Sveta Jelena, 16. 06, 2009., 1♀
Heriades truncorum (Linnaeus, 1758) – Cavići (Zagorje), 24. 06, 2005., 1♀; Devičić Draga, 19. 06, 2009., 1♂; Marčana, 22. 06, 2003., 1♀; Most-Raša, 22. 06, 2003., 2♂; Mošćenice, 15. 06, 2009., 1♀; Mošćenička Draga, 20. 06, 2003., 2♂; Rijeka: Pehljin, 16. 07, 1969., 5♀; Rovini, 16. 06, 2009., 1♂; Sveti Nikola (Rakalj), 22. 06, 2001., 1♀; Tribanj Kruščica, 19. 06, 2009., 1♂; Vela Učka, 16. 06, 2009., 1♀
Lithurgus chrysurus Fonscolombe, 1834 – Briševo, 20. 06, 2007., 1♂; Brseč, 21. 06, 2003., 1♂; Gorica, 21. 06, 2007., 1♀; Kakma, 21. 06, 2007., 1♀ 1♂; Klenovica, 18. 06, 2009., 1♂; Lukovo Šugarje, 19. 06, 2009., 2♂; Prešika, 21. 06, 2003., 1♂; Rijeka: Pehljin, 16. 07, 1969. 1♀; Senj, 18. 06, 2009., 1♂
Lithurgus cornutus (Fabricius, 1787) – Gorica, 21. 06, 2007., 1♀
Megachile apicalis Spinola, 1808 – Karlobag, 18. 06, 2009., 1♂; Klenovica, 18. 06, 2009., 1♂; Lukovo Šugarje, 19. 06, 2009., 1♂; Polača, 21. 06, 2007., 1♂; Senj, 18. 06, 2009., 1♂
Megachile albisecta (Klug, 1817) – Briševo, 22. 06, 2007., 1♂; Karlobag, 18. 06, 2009., 1♂; Koromačno: Tunarica, 22. 06, 2003., 1♂; Prešika, 21. 06, 2003., 1♂
Megachile bicoloriventris Mocsáry, 1878 – Rovini, 26. 05, 2008., 2♀
Megachile centuncularis (Linnaeus, 1758) – Cavići (Zagorje), 24. 06, 2005., 1♂; Brseč (N 3 km), 19. 06, 2001., 1♀; Lovran, 25. 04, 2007., 1♂, 26. 05, 2008., 1♀ 2♂; Most-Raša, 22. 06, 2003., 1♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♂
Megachile circumcincta (Kirby, 1802) – Hreljin, 27. 04, 2007., 1♂; Vrelo, 23. 06, 2007., 1♀
Megachile ericetorum Lepeletier, 1841 – Briševo, 20. 06, 2007., 1♂; Kakma, 21.06, 2007., 1♀
Megachile flabellipes Pérez, 1895 – Barić Draga, 22. 06, 2007., 1♀; Klenovica, 18. 06, 2009., 5♂; n. b. of Krk, 2♂; Lukovo Šugarje, 19. 06, 2009., 3♂; Radelić Draga, 19. 06, 2009., 4♂; Rijeka: Pehljin, 16. 07, 1969., 3♀ 6♂; Senj, 18, 06, 2009., 3♂
Megachile lagopoda (Linnaeus, 1761) – Prešika, 21. 06, 2007., 1♀ 1♂; Sveta Jelena, 24, 06, 2003., 1♀ 1♂, 16, 06, 2009., 1♂
Megachile leachella Curtis, 1828 – Nin: beach, 20. 06, 2007., 1♂
Megachile lefebvrei Lepeletier, 1841 – Briševo, 20. 06, 2007., 1♀, 1♂; Karlobag, 22. 06, 2007., 1♀; Klenovica, 18. 06, 2009., 1♀; Radelić Draga, 19. 06, 2009., 1♀ 4♂; Senj, 18. 06, 2009., 2♂; Sveta Jelena, 16. 06, 2009., 1♂; Tribanj Kruščica, 19. 06, 2009., 1♀
Megachile manicata Giraud, 1861 – Cerovica (Ravni), 26, 04, 2007., 1♀
Megachile maritima (Kirby, 1802) – Prešika, 21. 06, 2003., 1♂
Megachile melanopyga Costa, 1863 – Brseč, 21. 06, 2003., 1♀; n. b. of Krk, 30. 05, 2008., 1♀, 18. 06, 2009., 1♀; Martina, 16. 06, 2009., 2♀; Mošćenička Draga, 20. 06, 2003., 1♀
Megachile octosignata Nylander, 1852 – Cerovica (Ravni), 21. 06, 2003., 1♂; Koromačno: Tunarica, 22. 06, 2003., 1♂; Pićan, 17. 06, 2009., 1♀; Sveta Jelena, 25. 04, 2007., 1♂
Megachile parietina (Geoffroy, 1775) – Gračišće, 17. 06, 2009., 1♀; Hreljin, 27. 04, 2007., 3♂; Kanfanar: Dvigrad, 27. 06, 2005., 1♀; Koromačno (E 3 km), 20. 06, 2001., 2♀; Koromacno, 20. 06, 2003., 1♀;n. b. of Krk, 30, 05, 2008., 1♂; Prešika, 21. 06, 2007., 1♀; Radelić Draga, 19. 06, 2009., 1♀; Skitača, 26. 04, 2007., 2♂; Sveta Jelena, 24. 06, 2005., 1♀, 25, 04, 2007., 1♀; Sveti Nikola (Rakalj), 22. 06, 2001., 1♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♀; Vranja (E 5 km), 28. 05, 2008., 2♂
Megachile pilicrus Morawitz, 1877 – Brseč, 21. 06, 2003., 1♀; Cavići (Zagorje), 25. 06, 2004., 1♂, 24. 06, 2005., 2♂; Kanfanar: Dvigrad, 27. 06, 2005., 2♂; Karlobag, 18. 06, 2009., 1♀; Klenovica, 18. 06, 2009., 2♀; Koromačno, 21. 06, 2001., 1♂; Modriči, 19. 06, 2007., 1♀ 1♂; Mošćeniče, 20. 06, 2003., 1♂; Mošćenička Draga, 20. 06, 2003., 2♂; Prešika, 21. 06, 2003., 2♀; Radelić Draga, 19. 06, 2009., 1♂; Rovinj, 27. 06, 2008., Rovinjsko Selo, 27. 06, 2005., 1♀ 1♂; Senj, 18. 06, 2009., 1♂; Strepčići, 19. 06, 2001., 1♀; Sveta Jelena, 20. 06, 2003., 1♂, 21. 06, 2005., 1♂;
Megachile pilidens Alfken, 1924 – Briševo, 20. 06, 2007., 3♀ 2♂; Brseč (E 3 km), 19. 06, 2001., 1♀; Cavići (Zagorje), 25. 06, 2004., 1♀; Cerovica (Ravni), 21. 06, 2003., 1♀; Donji Lopci, 19. 06, 2007., 1♀; Golovik, 15. 06, 2009., 1♂; Karlobag, 19. 06, 2007., 1♀; Karojba, 17. 06, 2009., 3♂; Krk, 30. 05, 2008., 1♀; Labin:

Dubrava, 21. 06, 2003., 1♀; Modriči, 19. 06, 2009., 1♀; Petehi, 22. 06, 2001., 1♀; Pićan, 17. 06, 2009., 1♂; Poreč, 17. 07, 1969., 2♀; Radelić Draga, 19. 06, 2009., 1♀; Most-Raša, 22. 06, 2003., 1♀; Senj, 18. 06, 2009., 1♀; Sveta Jelena, 21. 06, 2003., 1♂

Megachile pyrenaica Lepeletier, 1841 – Cavići (Zagorje), 28. 06, 2004., 2♀; Hreljin, 27. 04, 2007., 2♀; Kanfanar: Dvigrad, 27. 06, 2005., 1♀; Koromacno (E 3 km), 20. 06, 2001., 2♀; n. b. of Krk, 27. 04, 2007., 1♀; Radelić Draga, 19. 06, 2009., 1♀; Susanj, 22. 06, 2007., 1♀; Sveta Jelena, 25. 04, 2007., 1♀, 26. 05, 2008., 2♀

Megachile rotundata (Fabricius, 1787) – Brseč (N 3 km), 18. 06, 2001., 1♂; Matesiči, 23. 06, 2007., 1♀; Tribanj Kruščica, 19. 06, 2009., 1♀

Megachile versicolor Smith, 1844 – Hreljin, 27. 04, 2007., 1♂

Megachile willoughbiella (Kirby, 1802) – Brovinje, 29. 05, 2008., 1♀; Brseč (N 3 km), 21. 06, 2001., 1♀; Brseč, 21. 06, 2003., 1♀; Karlobag, 22. 06, 2007., 1♀; Mošćenička Draga, 20. 06, 2003., 1♀; Sveta Jelena, 28. 05, 2008., 1♂

Osmia acuticornis Dufour & Perris, 1840 – Golovik, 26. 05, 2008., 1♀; Lovran, 26. 05, 2008., 1♂, 15. 06, 2009., 1♂; Salakovci, 29. 05, 2008. 1♀; Sveta Jelena, 26. 04, 2007., 1♂; Sveta Katarina, 27.05, 2008., 1♂; Vela Učka, 16. 06, 2009., 1♀; Vranja (E 5 km), 28. 05, 2008., 1♀ 1♂

Osmia adunca (Panzer, 1798) - Hreljin, 30 05, 2008., 2♀ 1♂; Rijeka: Pehljin 16. 07, 1969., 1♀ 1♂; Sveta Jelena, 20. 06, 2003., 1♀, 15. 06, 2009., 1♀; Tribanj Kruščica, 19. 06, 2009., 2♀

Osmia andrenoides Spinola, 1808 –Baške Oštarie, 22. 06, 2007., 1♀ 1♂; Brseč (E 3 km), 19. 06, 2001., 1♀; Cerovica (Ravni), 21. 06, 2003., 2♂; Golovik, 28. 05, 2008., 1♀; Hreljin, 27. 04, 2007., 1♀; Kanfanar: Dvigrad, 27. 05, 2008., 1♀; Koromačno, 20. 06, 2001., 2♀; n. b. of Krk, 18. 06, 20109., 1♂; Lovran, 25. 04, 2007., 1♀; Omišalj, 27. 04, 2007., 1♂; Reburići, 26. 04, 2007., 1♀; Rovini, 25. 04, 2007., 2♀; Salakovci, 29. 05, 2008., 1♀; Susanj, 22. 06, 2007., 1♂; Sveta Jelena, 20. 06, 2003., 2♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♀; Trolokve, 23. 06, 2007., 2♀;

Osmia aurulenta (Panzer, 1799) – Lindar, 17. 06, 2009., 1♀; Melvice, 19. 06, 2007., 1♀; Omišalj, 27. 04, 2007., 1♂; Pićan, 17. 06, 2009., 2♀; Sveta Jelena, 16. 06, 2009., 1♂; Sveta Katarina, 27. 05, 2008., 1♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♀

Osmia bidentata Morawitz, 1876 – Briševo, 20. 06, 2007., 3♂; Gorica, 21. 06, 2007., 3♀ 1♂; Kakma, 21. 06, 2007., 5♀; Karlobag, 18. 06, 2009., 3♂; Lukovo Šugarje, 19. 06, 2009., 5♂; Rijeka: Pehljin, 16. 07, 1969., 1♀; Tribanj Kruščica, 19. 06, 2009., 1♂

Osmia brevicornis (Fabricius, 1798) – Sveta Katarina, 27. 05, 2008., 2♂

Osmia campanularis Morawitz, 1877 – n. b. of Krk, 30. 05, 2008., 3♀ 1♂

Osmia caerulescens (Linnaeus, 1758) – Brovinje, 29. 05, 2008., 2♀; Devičić Draga, 19. 06, 2009., 1♂; Hreljin, 27. 04, 2007., 1♀; Kanfanar: Dvigrad, 27. 05, 2008., 1♀; Karlobag, 18. 06, 2009., 1♂; Klenovica, 18. 06, 2009., 1♀; Koromačno, 20.06, 2001., 1♀; Salakovci, 29. 05, 2008. 1♀; Susanj, 22. 06, 2007., 1♀; Sveta Jelena, 20. 06, 2003., 1♀, 15. 06, 2009., 1♂; Sveti Vid-Miholjice, 27. 04, 2007., 1♀

Osmia claviventris Thomson, 1872 – Baške Oštarie, 22. 06, 2007., 1♀

Osmia croatica Friese, 1893 – Karlobag, 28. 07, 1989., 1♂ (leg. Ábrahám)

Osmia cyanoxantha Pérez, 1879 – Hreljin, 27. 04, 2007., 1♀; Vranja (E 5 km), 28. 05, 2008., 1♀

Osmia dalmatica Morawitz, 1872 – Vela Učka, 16. 06, 2009., 4♀ 1♂

Osmia gallarum Spinola, 1808 – Hreljin, 27. 04, 2007., 2♂, 30. 05, 2008., 1♂; Ravni, 29. 05, 2008., 1♀; Sveta Jelena, 25. 04, 2007., 2♀ 3♂; Vranja (E 5 km), 28. 05, 2008., 1♂

Osmia leaiana (Kirby, 1802) – Mošćenička Draga, 20. 06, 2003., 1♂

Osmia leucomelana (Kirby, 1802) – Brovinje, 29. 05, 2008., 1♂; Most-Raša, 27. 06, 2004., 1♀ 4♂; Sveta Jelena, 16. 06, 2009., 1♂

Osmia ligurica Morawitz, 1868 – Funtana, 26. 06, 2004., 1♀; Krk, 27. 04, 2007., 1♂; Rijeka: Pehljin, 16. 07, 1969., 2♀; Sveta Jelena, 16. 06, 2009., 1♂; Vela Učka, 17. 06, 2009., 2♂

Osmia longiceps Morawitz, 1876 – Brovinje, 26. 04, 2007., 1♀ 1♂; Cerovica (Ravni), 26. 04, 2007., 3♂; Devičić Draga, 19. 06, 2009., 1♀; Hreljin, 27. 04, 2007., 2♀; Kanfanar: Dvigrad, 27. 06, 2005., 1♀; Lovran, 26. 05, 2008. 1♀; Pićan, 17. 06, 2009., 1♀; Most-Raša, 27. 06, 2004., 1♀; Ravni, 29. 05, 2008., 1♀; Rovini, 25. 04, 2007., 3♂; Salakovci, 29. 05, 2008., 1♀; Skitača, 26. 04, 2007., 1♂; Stanišovi, 29. 05, 2008., 1♀; Sveta Jelena, 25. 04, 2007., 1♀, 26. 05, 2008., 2♀ 1♂; Vranja (E 5 km), 28. 05, 2008., 1♂

Osmia loti Morawitz, 1867 – Brovinje, 26. 04, 2007. 2♀; Cavići (Zagorje), 26. 06, 2004, 1♀; Devičić Draga, 19. 06, 2009., 1♀; Golovik, 28. 05, 2008., 1♂; Koromačno (E 3 km), 20. 06, 2001., 7♀; n. b. of Krk, 27. 04, 2007., 2♀ 3♂; Omišalj, 27. 04, 2007., 1♀ 2♂; Skitača, 26. 04, 2007., 1♂; Stanišovi, 29. 05, 2008., 2♀; Sveta

Jelena, 24. 06, 2005., 1♀, 26. 04, 2007., 1♀ 2♂; Tribanj Kruščica, 19. 06, 2009., 1♀
Osmia manicata Morice, 1901 – Kanfanar: Dvigrad, 27. 06, 2005., 3♀ 2♂, 27. 05, 2008., 2♂; Krk, 25. 06, 2005., 1♀; Omišalj, 27. 04, 2007., 1♂; Rovinjsko Selo, 26. 06, 2004., 2♀ 1♂;
Osmia melanogaster Spinola, 1808 – Barić Draga, 22. 06, 2007., 1♂; Cavići (Zagorje), 28. 06, 2004., 1♀; Sveta Jelena, 15. 06, 2009., 1♀
Osmia mustelina Gerstaecker, 1869 – Kanfanar: Dvigrad, 27. 06, 2005., 1♀; Rovini, 26. 05, 2008., 1♀; Vranja (E 5 km), 28. 05, 2008. 1♀
Osmia niveata (Fabricius, 1804) – Brovinje, 29. 05, 2008., 1♀; Cavići (Zagorje), 24. 06, 2005., 1♀; Lovran, 26. 05, 2008., 1♀; Mošćenice, 25. 04, 2007., 1♂; Pićan, 17. 06, 2009.,1♀
Osmia padri (Tkalců, 1974) – Barić Draga, 22. 06, 2007., 1♀
Osmia perezi Ferton, 1895 – Golovik, 28. 05, 2008., 2♀; Reburići, 26. 04, 2007., 1♀; Rovini, 25. 04, 2007., 1♀ 1♂, 26. 05, 2008., 1♀ 1♂
Osmia praestans Morawitz, 1893 – Golovik, 28. 05, 2008., 2♂; n. b. of Krk, 30. 05, 2008., 1♀; Španidiga, 27. 05, 2008., 1♀; Susanj, 22. 06, 2007., 1♀; Sveta Jelena, 15. 06, 2009., 1♀; Vela Učka, 16. 06, 2009., 1♂
Osmia rubicola Friese, 1891 – Golovik, 26. 05, 2008., 2♀
Osmia rufa (Linnaeus, 1758) – Lovran, 25. 04, 2007., 1♀, 26, 05, 2008., 1♀; n. b. of Krk, 207. 04, 2007., 1♂; Mošćenice, 25. 04, 2007., 1♂; Sveta Jelena, 26. 05, 2008., 1♀
Osmia rufohirta Latreille, 1811 – Baške Oštarie, 22. 06, 2007., 1♀; Brovinje, 29. 05, 2008., 2♀; Cerovica (Ravni), 26. 04, 2007., 1♂; Donji Lopci, 19. 06, 2007., 1♀; Hreljin, 27. 04, 2007., 3♀ 1♂; Kanfanar: Dvigrad, 27. 06, 2005., 1♀, 27. 05, 2008., 1♀; Klenovica, 18. 06, 2009., 1♀; Koromačno, 20. 06, 2001., 1♀; Lovran, 25. 04, 2007., 2♀; Načinovići (Zagorje), 29. 05, 2008., 1♂; Njivice, 27. 04, 2007., 1♀; Reburići, 26. 04, 2007., 1♀; Španidiga, 27. 05, 2008., 1♀; Sveta Jelena, 26. 04, 2007., 1♂; Vranja (E 5 km), 28. 05, 2008., 1♀
Osmia scutellaris Morawitz, 1868 – Brovinje, 26. 04, 2007., 1♂; Cavići (Zagorje), 25. 06, 2004., 1♀; Hreljin, 30. 05, 2008., 2♂; Krk, 27. 04, 2007., 1♀; n. b. of Krk, 30. 05, 2008., 1♀; Lovran, 25. 04, 2007., 2♂; Martina, 29. 05, 2008., 1♀, 16. 06, 2009., 2♀; Ravni, 29. 05, 2008., 1♀; Sveta Jelena, 26. 04, 2007., 1♀
Osmia spinulosa (Kirby, 1802) – Baške Oštarie, 22. 06, 2007., 1♀ 2♂; Devičić Draga, 19. 06, 2009., 1♂; Mošćenička Draga, 20. 06, 2003., 1♂; Rijeka: Pehljin, 16. 07, 1969., 2♀ 1♂; Tribanj Kruščica, 19. 06, 2009., 2♂; Vrelo, 23. 06, 2007. 1♀
Osmia tenuispina Alfken, 1937 – Koromačno (E 3 km), 20. 06, 2001., 1♀; Načinovići (Zagorje), 28. 05, 2008., 1♂
Osmia tergestensis Ducke, 1897 – Sveta Jelena, 26. 05, 2008., 1♂
Osmia tridentata Dufour & Perris, 1840 – Prešika, 21. 06, 2003., 1♀; Most-Raša, 22. 06, 2003., 1♂; Rijeka: Pehljin, 16. 07, 1969., 3♀ 1♂; Sveta Jelena, 24. 06, 2003., 2♀
Osmia versicolor Latreille, 1811 – Golovik, 28. 05, 2008., 1♀; n. b. of Krk, 27. 04, 2007., 1♀; Kanfanar: Dvigrad, 27. 06, 2005., 1♀; Koromačno (E 3 km), 20. 06, 2001., 1♀; Martina, 28. 05, 2008., 1♀; Načinovići (Zagorje), 28. 05, 2008., 1♀; Omišalj, 27. 04, 2007., 1♀; Stanišovi, 29. 05, 2008., 2♀; Vranja (E 5 km), 28. 05, 2008., 1♂
Osmia xanthomelaena (Kirby, 1802) – Sveta Jelena, 26. 05, 2008., 1♀
Protosmia glutinosa (Giraud, 1871) – Sveta Jelena, 25. 04, 2007., 1♂
Protosmia graeffei (Schmiedeknecht, 1890) – Devičić Draga, 19. 06, 2009., 2♂; Ravni, 19. 05, 2008., 1♂; Rovinjsko Selo, 27. 05, 2008., 1♀
Protosmia tauricola Popov, 1961 – Brovinje, 04. 26, 2007., 1♀, 29. 05, 2008., 1♀; Koromačno (E 3km), 20. 06, 2001., 1♀
Stelis breviuscula (Nylander, 1848) – Klenovica, 18. 06, 2009., 1♂; Tribanj Kruščica, 19. 06, 2009., 2♂
Stelis minuta Lepeletier & Serville, 1825 – Sveta Jelena, 28. 05, 2008., 1♂
Stelis nasuta (Latreille, 1809) – Cerovica (Ravni), 21. 06, 2003., 1♀; Golovik, 28. 05, 2008., 2♂; Koromačno (E 3 km), 20. 06, 2001., 1♀; Lukovo Šugarje, 19. 06, 2009., 1♀; Prešika, 21. 06, 2003., 1♀; Rovini, 26. 05, 2008., 5♂, 16. 06, 2009., 1♀; Senj, 18. 06, 2009., 1♂
Stelis signata (Latreille, 1809) – Golovik, 28. 05, 2008., 1♀; Senj, 18. 06, 2009., 1♂

Anthophorinae

Amegilla albigena (Lepeletier, 1841) – Barić Draga, 22. 06, 2007., 4♀; Radelić Draga, 19. 06, 2009., 1♀; Rovinj, 26. 06, 2004., 1♀
Amegilla garrula (Rossi, 1790) – Brseč, 21. 06, 2003., 1♂; Gračišće, 17. 06, 2009., 1♂; Medulin, 27. 06, 2004., 1♂; Mošćenice, 20. 06, 2003., 1♀; Prešika, 21. 06, 2003., 1♂

Amegilla quadrifasciata (Villers, 1789 – Briševo, 20. 06, 2007., 2♀ 2♂; Gorica, 21. 06, 2007., 1♂; Gornji Poličnik, 20. 06, 2007., 1♀; Kakma, 21. 06, 2007., 1♀; Polača, 21. 06, 2007., 1♀; Prešika, 21. 06, 2003., 1♂; Rovinjsko Selo, 27. 06, 2005., 1♀; Sveta Jelena, 23. 06, 2003., 1♂; Tribanj Kruščica, 19. 06, 2009., 2♂
Ammobatoides abdominalis (Eversmann, 1852) – Sveta Jelena, 21. 06, 2003., 1♀
Anthophora atroalba Lepeletier, 1841 – Brovinje, 26. 04, 2007., 1♂; Cerovica (Ravni), 26. 04, 2007. 1♀; Golovik, 28. 05, 2008., 1♀ 3♂; Kapelica, 26. 04, 2007., 1♂; Skitača, 26. 04, 2007., 2♂; Sveta Jelena, 25. 04, 2007., 2♂
Anthophora crinipes Smith, 1841 – Reburići, 26., 04, 2007., 1♀; Sveta Katarina, 27. 05, 2008., 2♀ 1♂
Anthophora dufourii Lepeletier, 1841 – Brovinje, 29. 05, 2008., 1♀; Cavići (Zagorje), 27. 06, 2004., 2♀; Golovik, 28. 05, 2008., 1♀; Njivice, 27. 04, 2007., 1♂; Plomin, 27. 05, 2008., 1♂; Reburići, 26. 04, 2007., 1♂; Rovini, 28. 05, 2008., 1♀; Salakovci, 29. 05, 2008., 1♀; Skitača, 26. 04, 2007., 2♂; Sveta Jelena, 25. 04, 2007., 1♀ 3♂
Anthophora plumipes (Pallas, 1772) – Brovinje, 26. 04, 2007., 1♀; Cavići (Zagorje), 26. 06, 2004., 1♀; Cerovica (Ravni), 26. 04, 2007., 1♀; Lovran, 25. 04, 2007., 1♀ 2♂; Mošćenice, 25. 04, 2007., 1♀ 1♂; Rovini, 26. 05, 2008., 1♀; Skitača, 26. 04, 2007., 1♂;
Ceratina bispinosa Handlirsch, 1889 – Baške Oštarie, 22. 06, 2007., 1♀
Ceratina chalcites Germar, 1839 – Barić Draga, 22. 06, 2007., 1♀; Briševo, 20. 06, 2007., 3♀; Brseč, 21. 06, 2003., 1♀; Lukovo Šugarje, 19. 06, 2009., 1♀; Sveta Jelena, 23. 06, 2003., 1♂, 24. 06, 2005., 1♀ 1♂, 16. 06, 2009., 2♀; Tribanj Kruščica, 19. 06, 2009., 2♀ 1♂; Trolokve, 23. 06, 2007., 1♀
Ceratina chalybea Chevrier, 1872 – Koromačno, 20. 06, 2001., 1♀; Pićan, 17. 06, 2009., 1♀; Prešika, 21. 06, 2003., 1♀; Sveta Jelena, 20. 06, 2003., 2♀, 24. 06, 2005., 1♀, 15. 06, 2009., 2♀
Ceratina cucurbitina (Rossi, 1792) – Brseč, 21. 06, 2003., 1♀; Cerovica (Ravni), 26. 04, 2007., 1♀; Devičić Draga, 19. 06, 2009., 2♀; Donji Lopci, 19. 06, 2007., 2♀; Golovik, 26. 05, 2008., 1♀ 1♂; Gornji Dobra, 21. 06, 203., 1♂; Kakma, 21. 06, 2007., 1♀; Kanfanar: Dvigrad, 27. 06, 2005., 1♀, 27. 05, 2008., 1♂; Koromačno: Tunarica, 22. 06, 2003., 2♀; Lovran, 26, 05, 2008. 1♀ 1♂; Mošćenice, 25. 04, 2007., 1♂, 26. 05, 2008., 1♀; Pićan, 17. 06, 2009., 1♀; Polača, 21. 06, 2007., 1♀; Rovinjsko Selo, 27. 06, 2005., 2♀, Salakovci, 29. 05, 2008., 1♂; Senj, 18. 06, 2009., 2♀; Stanisovi, 29. 05, 2008., 1♀; Sveta Jelena, 24. 06, 2005., 1♀, 25. 04, 2007., 1♂, 26. 05, 2008., 2♂; Sveta Katarina, 27. 05, 2008., 1♀ 2♂; Tribanj Kruščica, 19. 06, 2009., 1♀; Vela Učka, 28. 05, 2008., 1♂; Vranja (E 5 km), 28. 05, 2008., 1♂
Ceratina cyanea (Kirby, 1802) – Cerovica (Ravni), 21. 06, 2003., 1♀; Devičić Draga, 19. 06, 2009., 1♂; Koromačno: Tunarica, 21. 06, 2003., 1♀; Lovran, 25. 04, 2007., 1♂; Lukovo Šugarje, 19. 06, 2009., 2♀; Modriči, 19. 06, 2007., 1♂; Omišalj, 27. 04, 2007., 1♀ 1♂; Polača, 21. 06, 2007., 1♀; Radelić Draga, 19. 06, 2009., 1♀; Most-Raša, 27. 06, 2004., 3♀; Rovini, 26. 05, 2008., 1♂; Senj, 18. 06, 2009., 1♂; Sveta Jelena, 24. 06, 2005., 1♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♂; Tribanj Kruščica, 19. 06, 2009.,1♀; Vranja (E 5 km), 28. 05, 2008., 1♀
Ceratina dallatorreana Friese, 1896 – Briševo, 20. 06, 2007., 1♀
Ceratina dentiventris Gerstaecker, 1889 – Devičić Draga, 19. 06, 2009. 3♀; Donji Lopci, 19. 06, 2007., 1♀; Senj, 18. 06, 2009., 2♀ 3♂; Tribanj Kruščica, 19. 06, 2009., 1♀
Ceratina nigrolabiata Friese, 1896 – Pićan, 17. 06, 2009., 1♀; Tribanj Kruščica, 19. 06, 2009., 1♀
Ceratina parvula Smith, 1854 – Devičić Draga, 19. 06, 2009., 1♀
Epeolus variegatus (Linnaeus, 1758) – Sveta Jelena, 16. 06, 2009., 1♂
Eucera caspica Morawitz, 1873 – Hreljin, 30. 05, 2008., 1♀; Salakovci, 29. 05, 2008., 1♀
Eucera clypeata Erichson, 1835 – Rovinj: Borik, 27. 05, 2008., 1♀; Rovinjsko Selo, 27. 05, 2008., 1♀
Eucera dalmatica Lepeletier, 1841 – Kakma, 21. 06, 2007., 2♀ 1♂; Polača, 21. 06, 2007., 2♀; Tribanj Kruščica, 19. 06, 2009., 1♂
Eucera eucnemidea Dours, 1873, Karojba, 17. 06, 2009., 1♂
Eucera interrupta Baer, 1850 – Brovinje, 29. 05, 2008., 1♀; Cavići (Zagorje), 25. 06, 2004, 1♀; Lovran, 26. 05, 2008., 1♀; Mošćenice, 20. 06, 2003., 1♀; Reburići, 26. 04, 2007., 1♀; Sveta Jelena, 20. 06, 2003., 1♀, 24. 06, 2004., 1♀, 26. 05, 2008., 3♀; Sveta Katarina, 27. 05, 2008., 2♂; Sveti Vid-Miholjice, 27. 04, 2007., 1♀; Tribanj Kruščica, 19. 06, 2009., 1♀
Eucera longicornis (Linnaeus, 1758) – Lovran, 26. 05, 2008., 1♂; Mošćenice, 26. 05, 2008., 1♂; Plomin, 19. 065, 2001., 1♀; Reburići, 26. 04, 2007., 1♂; Španidiga, 27. 05, 2008., 3♀; Sveta Jelena, 24. 06, 2005., 2♀, 26. 05, 2008., 1♀
Eucera nigrescens Pérez, 1879 – Cerovica (Ravni), 26. 04, 2007., 1♀ 1♂; Golovik, 28. 05, 2008., 1♀ 1♂; Kanfanar: Dvigrad, 27. 05, 2008., 2♀; Krk, 27. 04, 2007., 1♂; Lovran, 25. 04, 2007., 1♂, 26. 05, 2008., 1♀;

Mošćenice, 25. 04, 2007., 1♀ 1♂; Njivice, 27. 04, 2007., 1♂; Rovini, 25. 04, 2007., 1♀; Skitača, 26. 04, 2007., 1♂; Sveta Jelena, 25. 04, 2007., 3♀ 1♂, 26. 05, 2008., 1♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♂
Eucera parvula Friese, 1895 – Cerovica (Ravni), 26. 04, 2007., 2♂; Kanfanar: Dvigrad, 27. 05, 2008., 2♀; Kapelica, 26. 04, 2007., 2♂;
Eucera pollinosa Smith, 1854 – Most-Raša, 27. 06, 2004., 1♀
Eupavlovskia funeraria (Smith, 1854) – Lovran, 25. 04, 2007., 1♀
Habropoda tarsata (Spinola, 1838) – Cerovica (Ravni), 26. 04, 2007., 1♀; Martina, 26. 04, 2007., 1♀;Reburići, 26. 04, 2007., 2♀; Sveta Jelena, 25. 04, 2007., 1♀
Melecta albifrons Forster, 1771 – Cerovica (Ravni), 26. 04, 2007., 1♂; Kanfanar: Dvigrad, 27. 05, 2008., 1♂; Lovran, 25. 04, 2007., 1♀ 2♂, 26. 05, 2008., 1♀; Mošćenice, 25. 04, 2007., 1♂; Rovini, 26. 05, 2008., 1♂; Skitača, 26. 04, 2007., 1♂; Sveta Jelena, 25. 04, 2007., 3♂
Melecta albifrons albovaria Eversmann, 1840 – Cavići (Zagorje), 27. 06, 2004., 1♀; Lovran, 26. 05, 2008., 1♀
Melecta luctuosa (Scopoli, 1770) – Rovini, 25. 04, 2007., 1♀
Nomada armata Herrich-Schaeffer, 1839 – Sveta Jelena, 15. 06, 2009., 1♀
Nomada basalis Herrich-Schaeffer, 1839 – Hreljin, 27. 04, 2007., 1♀, 30. 05, 2008., 1♀
Nomada bluethgeni Stöckhert, 1942 – Kanfanar: Dvigrad, 27. 06, 2005., 1♂; Krk, 25. 06, 2005., 1♂; Sveta Jelena, 21. 06, 2003., 1♀
Nomada distinguenda Morawitz, 1874 – Karojba, 17. 06, 2009., 1♂; Lovran, 25. 04, 2007., 2♂; Rovini, 16. 06, 2009., 1♂; Stanisovi, 29. 05, 2009, 1♀
Nomada facilis Schwarz, 1967 – Vela Učka, 17. 06, 2009., 1♀
Nomada femoralis Morawitz, 1869 – Reburići, 26. 04, 2007., 1♀
Nomada flavoguttata (Kirby, 1802) – Lovran, 26. 05, 2008., 2♂; Podhum, 26. 05, 2008., 1♂
Nomada fucata Panzer, 1798 – Vrsar, 26. 06, 2004., 1♂
Nomda furva Panzer, 1798 – Krk, 25. 06, 2005., 1♀ 1♂
Nomada furvoides Stöckhert, 1944 – Brovinje, 26. 04, 2007., 1♀; Lovran, 25. 04, 2007., 1♀ 1♂; Koromačno, 26. 06, 2001., 3♂
Nomada goodeniana (Kirby, 1802) – Podhum, 26. 05, 2008., 1♀; Sveta Jelena, 25. 04, 2005., 1♀
Nomada incisa Schmiedeknecht, 1882 – Lovran, 26. 05, 2008., 1♂
Nomada integra Brullé, 1832 – Podhum, 15. 06, 2009., 1♀; Skitača, 26. 04, 2007., 1♀; Sveti Vid-Miholjice, 27. 04, 2007., 1♀
Nomada nobilis Herrich-Schaeffer, 1839 – Funtana, 26. 06, 2004., 1♀; Lovran, 25. 04, 2007., 1♂; Mošćenička Draga, 20. 06, 2003., 1♀♀; Sveta Jelena, 26. 05, 2008., 1♂; Sveti Vid-Miholjice, 27. 04, 2007., 1♂
Nomada sexfasciata (Panzer, 1799 – Cerovica (Ravni), 26. 04, 2007., 2♂; Lovran, 25. 04, 2007., 1♀ 3♂; Sveta Jelena, 25. 04, 2007., 1♂
Nomada sheppardana (Kirby, 1802) – Krk, 25. 06, 2005., 1♀
Nomada stigma Fabricius, 1804 – Sveta Jelena, 20. 06, 2003., 1♀
Nomada succincta Panzer, 1798 – Sveta Jelena, 16. 06, 2009., 2♀
Nomada symphyti Stöckhert, 1930 – Sveta Katarina, 27. 05, 2008., 2♀ 1♂
Nomada tridentirostris Dours, 1873 – Funtana, 26. 06, 2004., 1♀; Sveta Jelena, 21. 06, 2003., 1♀
Nomada verna Schmiedeknecht, 1882 – Lovran, 25. 04, 2007., 1♀
Pasites maculatus Jurine, 1807 – Polača, 21. 06, 2007., 1♀; .Sveta Jelena, 24. 06, 2005., 1♀; Vrsar, 26. 06, 2004., 1♀
Tetralonia alticincta (Lepeletier, 1841) – Lindar, 17. 06, 2009., 1♀
Tetralonia fulvescens Giraud, 1863 – Grabrk, 19. 06, 2007., 1♀; Lindar, 17. 06, 2009., 3♀ 4♂; Vela Učka, 16. 06, 2009., 1♂
Thyreus ramosus (Lepeletier, 1841) – Marčana, 22. 06, 2003., 1♀
Xylocopa iris (Christ, 1791) – Načinovići (Zagorje), 29. 05, 2008., 1♀; Prešika, 21. 06, 2003., 1♀
Xylocopa valga Gerstaecker, 1872 – Bibinje, 3-10. 08, 2002., 1♀ (leg. Ábrahám); Brseč, 21. 06, 2003., 1♀; Mošćenička Draga, 20. 06, 2003., 1♀; Prešika, 21. 06, 2007., 1♀; Rovinjsko Selo, 27. 06, 2005., 1♀; Sveta Jelena, 24. 06, 2005., 1♂, 16. 06, 2009., 1♂; Tribanj Krušćica, 19. 06, 2009., 1♂
Xylocopa violacea (Linnaeus, 1758) – Barić Draga, 22. 06, 2007., 1♂; Grabrk, 19. 06, 2007., 1♀; Krk, 27. 04, 2007., 1♀ 1♂; Polača, 21. 06, 2007., 1♀; Sveta Jelena, 16. 06, 2009., 1♀ 2♂

Apinae

Bombus argillaceus (Scopoli, 1763) – Poreč, 17. 07, 1969., 7♂

Bombus hortorum (Linnaeus, 1761) – Plomin, 17. 07, 1969., 1♀; Sveta Jelena, 16. 06, 2009., 1♀ 1♂; Vela Učka, 16. 06, 2009., 2♀

Bombus hypnorum (Linnaeus, 1758) – Melvice, 19. 06, 2007., 1♀

Bombus lapidarius (Linnaeus, 1758) – Gornji Dobra, 20. 06, 2003., 1♀; Podhum, 15. 06, 2009., 2♀; Vela Učka 16. 06, 2009., 3♀

Bombus pascuorum (Scopoli, 1763) – Gornji Dobra, 20. 06, 2003., 1♀; Mošćenice, 15. 06, 2009., 1♀; Poreč, 17. 07, 1969., 1♂; Prešika, 21. 06, 2003., 2♀; Sveta Jelena, 24. 06, 2005., 2♀

Bombus pratorum (Linnaeus, 1761) – Vela Učka, 16. 06, 2009., 1♀ 1♂

Bombus ruderarius (Müller, 1776) – Vela Učka, 16. 06, 2009., 1♀

Bombus ruderatus Fabricius, 1775 – Cavići (Zagorje), 25. 06, 2004., 1♂; Sveta Jelena, 26. 06, 2005. 1♂

Bombus rupestris (Fabricius, 1793) – Koromačno, 20. 06, 2001., 1♂

Bombus terrestris (Linnaeus, 1758) – Cavići (Zagorje), 25. 06, 2005., 2♀; Mošćenička Draga, 20. 06, 2003., 1♀ 1♂; Koromačno, 21. 06, 2001., 1♀; Podhum, 15. 06, 2009., 1♀, Sveta Jelena, 20. 06, 2003., 1♀, 16. 06, 2009. 2♀

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DOI:10.24394/NatSom.2009.15.181 | Natura Somogyiensis | 15 | 181-194 | Kaposvár, 2009

Contribution to the Microlepidoptera fauna of Balkans, Nr. 1 (Lepidoptera)

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Fazekas, I.: *Contribution to the Microlepidoptera fauna of Balkans, Nr. 1 (Lepidoptera).*
Abstract: New records of 41 species collected in Balkans during more collecting trips between 1985 and 1996 are given. These species were observed during the day and night field surveys. Distributional or taxonomical notes are given for other species. *Acrolepiopsis vesperella* (Zeller, 1840) *Herculia incarnatalis* (Zeller, 1847) and *Crassa unitella* (Hübner, 1796) are recorded for the first time in Bulgaria. *Yponomeuta rorella* (Hübner, 1796), *Y. cagnagella* (Hübner, 1813), *Ethmia bipunctella* (Fabricius, 1775) and *Metacrambus carectellus* (Zeller, 1847) are new species in Croatian fauna. *Acompsia tripunctella* ([Denis & Schiffermüller], 1775) is new to Greece. With 10 figures.

Keywords: Microlepidoptera, Balkans, faunistic, new records.

Introduction

The knowledge of the Balkans fauna has been enriched by the work of both amateur and professional researchers. It was a milestone when Karsholt and Razowski (1996) published their checklist of the Microlepidoptera of Europe. Levente Ábrahám (H-Kaposvár) has undertaken zoological expeditions in Balkans between 1985 and 1989. Imre Fazekas (H-Komló) and Kálmán Szeőke (H-Székesfehérvár) have both collected a few specimens in the region. In this paper records of 41 species collected during these expeditions are published and notes on distribution and taxonomy are presented. The present paper adds more new data collected during the author's field work in Balkans. The occurrence of *Acrolepiopsis vesperella* (Zeller, 1840), *Herculia incarnatalis* (Zeller, 1847) and *Crassa unitella* (Hübner, 1796) in Bulgaria is not surprising, the first records of the taxa. *Yponomeuta rorrella* (Hübner, 1796), *Y. cagnagella* (Hübner, 1813), *Ethmia bipunctella* (Fabricius, 1775) and *Metacrambus carectellus* (Zeller, 1847) are new to the Croatian fauna. *Acompsia tripunctella* ([Denis & Schiffermüller], 1775) is new to Greece. All specimens are deposited in the Lepidoptera Collection of the Somogy County Museum in Kaposvár and Biological Department of Regiograf Institute in Komló. Basically we apply the system and nomenclature of Karsholt and Razowski (1996), with some minor changes.

List of localities: – Bosnia, Neum, N 42°55'36.68" E 17°38'9.13"; – Bulgaria, Fazanovo, N 42°12'09.36" E 27°41'59.66"; – Bulgaria, Lozenets, N 42°12'09.36" E 27°47'55.00"; – Croatia, Popovec, N 45°51'16.31" E 16°8'21.91"; Croatia, Umag, N 45°25'57.56" E 13°32'9.46"; Croatia, Zadar, N 44°9'10.44" E 15°13'43.53"; – Greece, Lakmos Mts., N 39°40'60.00" E 21°7'0.00".

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

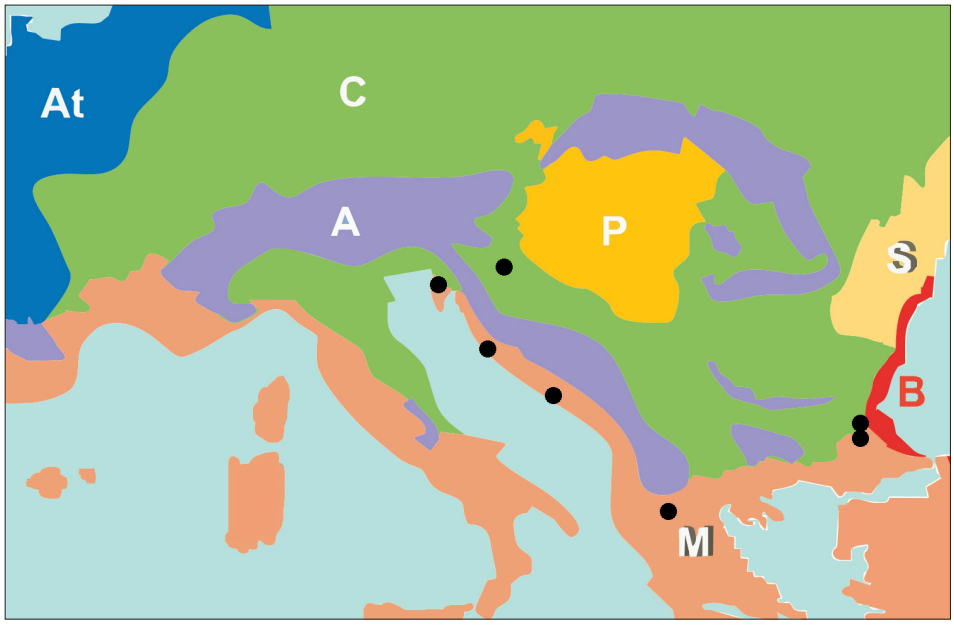


Fig. 1: Biogeographical regions in SO Europe and collecting sites (●) of Microlepidoptera in Balkans. Abbreviations: A= Alpine, At= Atlantic, B= Black sea, C= Continental, M= Mediterranean, P= Pannonian, S= Steppic

List of collected species

Nepticulidae

Ectoedemia mahalebella (Klimesch, 1936)

Material examined: 2 ex, Bosnia, Neum, 30.06.1996, leg. Fazekas I. – According to NIEUKERKEN (1985) a southern European species, south and east of the Alps, including hot alpine valleys. Oligophagous; the larvae feed on *Prunus avium* L., *P. cerasus* L., *P. comomilia* Ten., *P. fruticosa* Pallas and *P. mahaleb* L. Adults fly from May to end of June.

Tineidae

Hapsifera luridella Zeller, 1847

Material examined: 2 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L.; 1 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – Distribution in Balkans: Bulgaria, Macedonia, Greece, Crete, Cyprus. This species is unknown elsewhere in Europe.

Ypononeutidae

Yponomeuta rorrella (Hübner, 1796)

Material examined: 2 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L.; 2 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – new species in the fauna of Croatia. Old published records from Bosnia (GEORGIJEVIĆ & LUTERŠEK 1966). A relatively local species, occurring sporadically in much of Europe. Oligophagous: the larvae feed on species of *Salix*, including *S. alba* L. and *S. cinerea* L. They feed gregariously on the leaves in a silken web, between early May and late July. The moths fly in July and August.

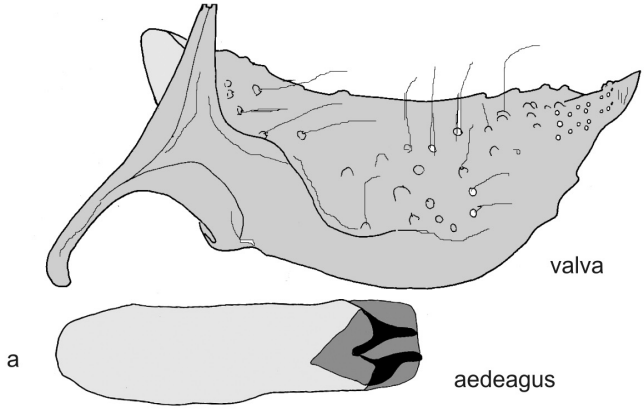
Yponomeuta cagnagella (Hübner, 1813)

Material examined: 2 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L.; 1 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – new species in the fauna of Croatia. Widely distributed in Europe, but is absent in other Balkan countries (see www.faunaeur.org). The moths fly from June to August. Monophagous on spindle (*Euonymus europaeus* L.), the larvae feeding gregariously in a silken web.

Acrolepiidae

Acrolepiopsis vesperella (Zeller, 1840)

Material examined: 1 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L. New species in the fauna of Bulgaria. Distribution: North Africa, the whole European Mediterranean region and Germany. Rare and local in Balkans: Croatia, Serbia, Montenegro, Kosovo and Greece. The larvae are miners on *Tamus edulis* Lowe and *Smilax canariensis* Willd.



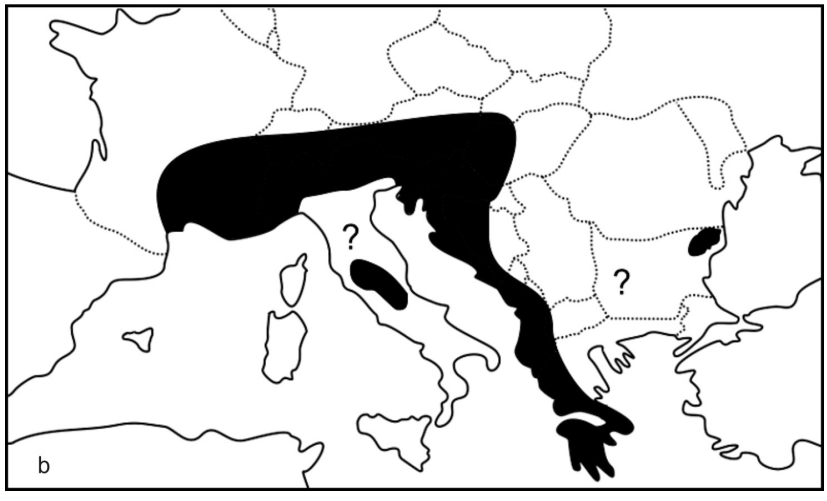


Fig. 2: *Ectodemia mahalebella* (Klimesch, 1936): a) male genitalia; b) sketch-map of distribution

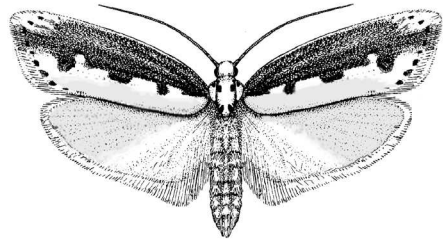


Fig. 3: Adult of *Ethmia bipunctella* (Fabricius, 1775)

Ethmiidae

Ethmia bipunctella (Fabricius, 1775)

Material examined: 1 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. New species in the fauna of Croatia, and yet to be reported in other Balkan countries; widely distributed in Europe. *Echium vulgare* L. is the larval foodplant in this region, both flowers and leaves being consumed. According to literature (SATTLER 1967) additional foodplants: *Echium calycinum* Viv., *Cynoglossum officinale* L., *Anchusa* L. spp. and *Lithospermum* L. spp. Outside Palaearctic well-known in North America. The main flight period is between May and August in Central Europe, but there is also a partial second generation in the autumn.

Oecophoridae

Epicallima icterinella (Mann, 1867)

Material examined: 1 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L. According to KARSHOLT & RAZOWSKI (1996), known only in former Yugoslavia, Bulgaria and Greece (see www.faunaeur.org).

Pleurota pyropella ([Denis & Schiffermüller], 1775)

Material examined: 1 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L. – this species is known to be frequent in Balkans.

Crassa unitella (Hübner, 1796)

Material examined: 1 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L. – the first record of the taxon in Bulgaria. A rather local and rare species throughout in Balkans: Albania, Kosovo, Macedonia, Montenegro, Romania, Serbia. The moths fly from early June till the end of August. The larva lives on dead wood and fungus under bark of various trees; it hibernates. Pupation in the larval feeding place.

Blastobasidae

Blastobasis phycidella (Zeller, 1849)

Material examined: 3 ex, Croatia, Zadar, 29.07.1989, leg. Ábrahám L. – widely distributed in Europe, except the northern areas (e. g. Scandinavia). The moths fly in one generation between early June and late August.

Gelechiidae

Stomopterix detersella (Zeller, 1847)

Material examined: 1 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L. – on the whole distributed in Balkans but unknown in Serbia and Montenegro. The species is unknown in many parts of Central Europe. In the Carpathian Basin (e.g. Transdanubian Mountains in Hungary) the habitat is rather barren, in rocky highlands.

Acompsia tripunctella ([Denis & Schiffermüller], 1775)

Material examined: 1 ex, Greece, 1700 m, Lakmos mts. 06.06.1990, leg. dr. Szeőke K. – new species in the fauna of Greece. Distribution in Europe: Austria, Croatia, Chechia, France, Germany, Hungary, Italy, Kosovo, Montenegro, Poland, Serbia, Slovakia, Slovenia, Switzerland, Ukraine. The species occurs in mountains regions in Balkans.

Tortricidae

Croesia forsskaleana (Linnaeus, 1758)

Material examined: 1 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L. – larva oligophagous on *Acer* spp. Univoltine: early or mid-July to late August. Widely distributed in Europe, introduced to North America.

Eudemis profundana ([Denis & Schiffermüller], 1775)

Material examined: 1 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – West Palaearctic species, except for the northern belt and Asia Minor.

Hedya nubiferana (Hübner, [1796–99])

Material examined: 1 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L. – larva polyphagous on *Rosaceae* spp., *Alnus, Betula, Salix, Quercus* etc. Holarctic. Adult flight from early June to late August. Widely distributed from British Isles to the Urals and from the White Sea to Caucasus. In Asia: Asia Minor to Iran and Iraq, then Turkmenia and Western Siberia, introduced Canada.

Epiblema scutulanum ([Denis & Schiffermüller], 1775)

Material examined: 1 ex, Croatia, Zadar, 29.07.1989, leg. Ábrahám L. – xerothermophilous species, polyphagous on *Arctium, Carduus, Centaurea, Cirsium, Jacea* etc., widely distributed in Palaearctic. In Balkans frequent.

Cydia fagiglandana (Zeller, 1841)

Examined material: 1 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – occurs from Iran to British Isles and Scandinavia. The moth flies in two generation between May and late August. Larva oligophagous on *Fagus sylvatica* L., rarely on *Quercus* spp. and *Castanea sativa* Mill.

Pterophoridae

Agdistis adactyla (Hübner, [1819])

Material examined: 1 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – widely distributed SW, C Europe and extending to the east as far as Afghanistan and Mongolia. Xerothermophilous, preferring steppes and colline habitats. Univoltine, flying from early June to late August.

Stenoptilia bipunctidactyla (Scopoli, 1763)

Material examined: 1 ex, Croatia, Zadar, 29.07.1989, leg. Ábrahám, L. – known from Mongolia, Iran to Europe and Northern Africa (FAZEKAS 2006). Polyphagous on *Antirrhinum orantium* L., *Knautia arvensis* L. *Linaria vulgaris* Miller, *Scabiosa columbaria* L., *S. ochroleuca* L., *Succisa pratensis* Moench (FAZEKAS 2006). Bivoltine; the moths fly from mid-May to mid-July and from early August to mid-October. Preferred habitats are moist rich fens, eu- and mesotrophic meadows, colline and montane hay meadows, acid grasslands and heaths. According to GIELIS (1996), this species is correctly called *bipunctidactyla*, but its status is uncertain and needs verification. Its affinity with *Pterophorus plagiodactylus, P. serotinus, P. scabiodactylus* and *Stenoptilia succisae* is uncertain and remains problematic (see ARENBERGER 2005).

Pterophorus pentadactylus (Linnaeus, 1758)

Material examined: 4 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L. – frequent in Balkans, the adult flies from May to late September. Oligophagous on *Convolvulus*

arvensis L., *C. cantabrica* L. and C*alystegia sepium* L. Habitat: ubiquitous in colline and montane hay meadows, acid grasslands and heaths; halophytic habitats, dry open grasslands; dry and semi-dry closed grasslands; secondary and degraded marshes and grasslands; semi-natural, often secondary woodland-grassland mosaics.

Pyralidae

Hypsopygia costalis (Fabricius, 1775)

Material examined: 1 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – widespread in Europe, but absent from Ireland and Slovenia.

Herculia incarnatalis (Zeller, 1847)

Material examined: 2 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L.; 5 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – South European species: Portugal, Spain, France, Italy, Croatia, Hungary, Romania and Greece. New species for the Bulgarian fauna.

Synaphe punctalis (Fabricius, 1775) (= *angustalis* Denis & Schiffermüller, 1775)

Material examined: 1 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – widespread in Europe, but unknown in north east regions.

Orthopygia glaucinalis (Linnaeus, 1758)

Material examined: 2 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L.; 2 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – this species has been collected in many places in Balkans, but is absent from Slovenia, Serbia and Montenegro.

Pyralis regalis ([Denis & Schiffermüller], 1775)

Material examined: 2 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L.; 6 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – known mainly in South-eastern Europe. Unknown in British Isles, Benelux States, Germany, Portugal, Slovenia and Norway.

Endotricha flammealis ([Denis & Schiffermüller], 1775)

Material examined: 2 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L.; 1 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – frequent in Balkans.

Phycita roborella ([Denis & Schiffermüller], 1775) (= *spissicella* Fabricius, 1777)

Material examined: 2 ex, Croatia, Popovec, 18.07.1985 and 10 ex, 24.07.1985, leg. Ábrahám L. – widely distributed in Europe, but in Balkans absent from Slovenia, Bosnia, Serbia and Montenegro.

Conobathra repandana (Fabricius, 1798) (= *tumidella* Zincken, 1818)

Material examined: 1 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L.; 1 ex, Croatia, Zadar, 29.07.1989, leg. Ábrahám L. – this species known in Balkans so far in Croatia, Bulgaria and Greece. No data from Ireland nor from much of Eastern Europe.

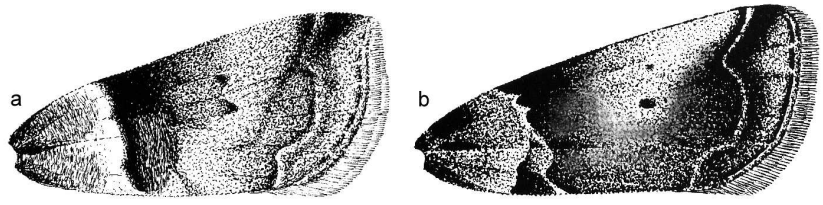


Fig. 4: Forewing of species: a) *Conobathra repandana* (Fabricius, 1798); b) *Trachycera suavella* (Zincken, 1818).

Trachycera suavella (Zincken, 1818)

Material examined: 1 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L.; 1 ex, Croatia, Zadar, 29.07.1989, leg. Ábrahám L. – in the Balkans, unknown from Slovenia and Serbia.

Ephestia elutella (Hübner, 1796)

Material examined: 2 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L. – widely distributed in Balkans but no data from Serbia.

Ematheudes punctella (Treitschke, 1833)

Material examined: 2 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – unknown in northern Europe. No published records from Slovenia and Serbia.

Crambidae

Calamotropha paludella (Hübner, [1824])

Material examined: 1 ex, Bulgaria, Lozenets 17.07.1988, leg. Ábrahám L. – known in Eurasia, Africa, Madagascar and Australia. Widely distributed in Balkans, but local in central countries (e. g. Serbia, Croatia).

Agriphila tolli tolli (Bleszynski, 1952)

Material examined: 4 ex, Croatia, Umag, 16.08.1994, leg. Fazekas I. – *A. tolli* can mainly be found in central and eastern Mediterranean region characterized by warm summer and evergreen, sclerophyllous forest. The Carpathian basin, however, featured by wet continental climate, is mostly populated by *Agriphila tolli* subspecies *pelsonius* Fazekas, 1985. Outside Europe, in western Asia (Asia Minor, Cyprus, Syria, Iraq, Iran,

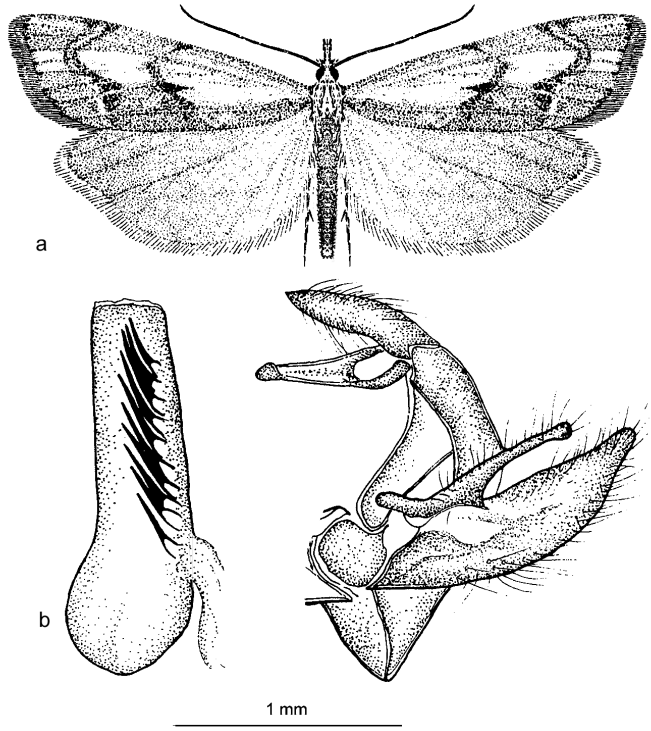


Fig. 5: Adult (a) and male genitalia (b) of *Agriphila tolli* (Bleszynski, 1952)

Fig. 6: Sketch-map of distribution of *Agriphila tolli* subspecies-circle: (Att) *Agriphila tolli tolli* (Bleszynski, 1952); (Atp) *A. tolli pelsonius* Fazekas, 1985; (Atb) *A. tolli beieri* Bleszynski, 1955

Caucasus etc.) the well-known subspecies *A. tolli beieri* Bleszynski, 1955 is found (FAZEKAS 1991c). *Agriphila geniculea* (Haworth, 1811) and *A. tolli* are two very similar species, separable in genitalia and wing pattern (FAZEKAS 1995: Abb. 2; 2002: Fig. 1.). According to the chorological data available, *A. geniculea* is an expansive Atlantic-Mediterranean species, while *A. tolli* is a typical element of the Pontomediterranean fauna. The species-pair evolved from one monophyletic unit, and are real geo-ecological vicariants (FAZEKAS 1995), which are not known to occur sympatrically in Balkans.

Agriphila brioniella Zerny, 1914

Material examined: 2 ex, Croatia, Umag, 16.08.1994, leg. Fazekas I. – distribution: Transcaucasia, Crimaea peninsula, Asia Minor, Cyprus, Balkans, Hungary, Slovakia, Italy, Sardinia, Sicily, South France (FAZEKAS 1991a). Differentiation of characters between *Agriphila inquinatella* and *A. brioniella* are according to FAZEKAS (1991a).

Agriphila inquinatella ([Denis & Schiffermüller], 1775)

Material examined: 12 ex, Croatia, Umag, 16.08.1994, leg. Fazekas I. – according to FAZEKAS (1991b): "Die Art inquinatella wurde von Marokko und in ganz Europa sowie östlich bis Turkestan nachgewiesen und zwar vor allem aus Gebieten mit sandigem, kalkigem und vulkanischem Boden. Habitate von Tief- und Gebirgsländern werden vielerorts von dieser Art bewohnt."

Catoptria pinella (Linnaeus, 1758)

Material examined: 1 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – widely distributed from Japan to Europe and North Africa. The moths fly from mid-May to mid-September. Frequent in Balkans.

Catoptria falsella ([Denis & Schiffermüller], 1775)

Material examined: 1 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L. – in Europe, frequent in south Scandinavia and Central Europe, local in British Isles and

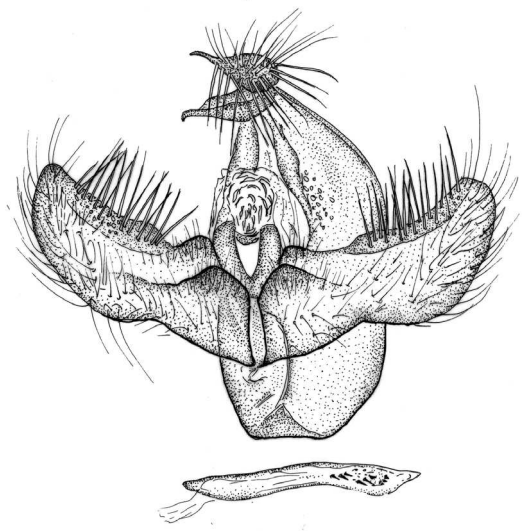


Fig. 7: Male genitalia of *Metacrambus carectellus* (Zeller, 1847)

Iberia. Collected throughout the Balkans. The moths fly in two generation from mid-May to mid-October. Adults occur in meso- and hygrophyl biotopes.

Metacrambus carectellus (Zeller, 1847)

Material examined: 5 ex, Croatia, Zadar, 29.07.1989, leg. Ábrahám, L. – according to SLAMKA (2008) unknown in Croatia (see 125th in map: p. 79). In Balkans, known from Bulgaria, Greece, Macedonia and Albania. New species in the fauna of Croatia.

Gesneria centuriella ([Denis & Schiffermüller], 1775)

Material examined: 2 ex, Bulgaria, Fazanovo, 18.07.1985. leg. Ábrahám, L. – Holarctic, boreomontane species. In Balkans, not known from Serbia, Slovenia, Croatia, Bosnia, Macedonia or Albania. According to NUSS (2005), adults have been collected at light on sandy slopes or screes with sparse vegetation and in subaalpine forests close to the tree line.

Pyrausta aurata (Scopoli, 1763)

Material examined: 1 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L. – local in Balkans. The moths fly in two generation from mid-April to mid-September; flies in the daytime and visits flowers. Adults occur in xero- and mesophyl biotopes. Forewing deep purple, suffused blackish; hindwing blackish with curved golden yellow postmedian line and basal patch (Fig. 8).

Loxostege sticticalis (Linnaeus, 1761)

Material examined: 9 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L.; 2 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L. – frequent in Balkans.

Uresiphita gilvata (Fabricius, 1794)

Material examined: 2 ex, Croatia, Zadar, 29.07.1989, leg. Ábrahám L. – not very frequent in Balkans, unknown in Albania.

Nomophila noctuella ([Denis & Schiffermüller], 1775)

Material examined: 2 ex, Bulgaria, Fazanovo, 18.07.1985, leg. Ábrahám L.; 1 ex, Croatia, Popovec, 24.07.1985, leg. Ábrahám L.; 1 ex, Croatia, Zadar, 29.07.1989, leg. Ábrahám L. – frequent and widely distributed in Balkans.

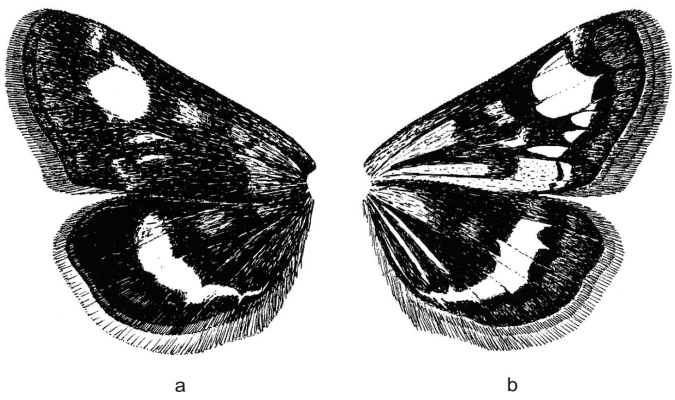
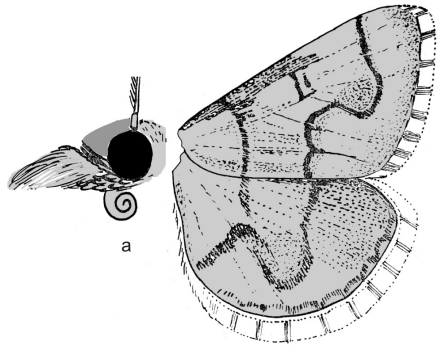


Fig. 8: Forewing patterns of *Pyrausta aurata* (Scopoli, 1763): a) underside, b) upperside



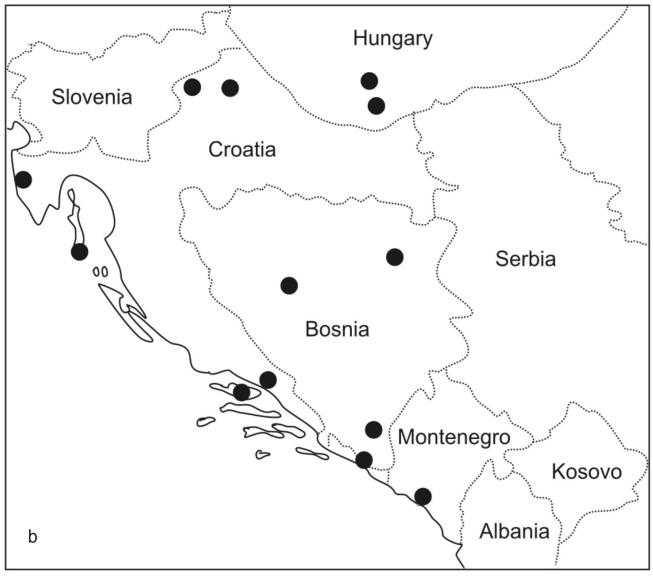


Fig. 9: *Metasia ophialis* (Treitschke, 1829): a) head and forewing; b) records of from western Balkans

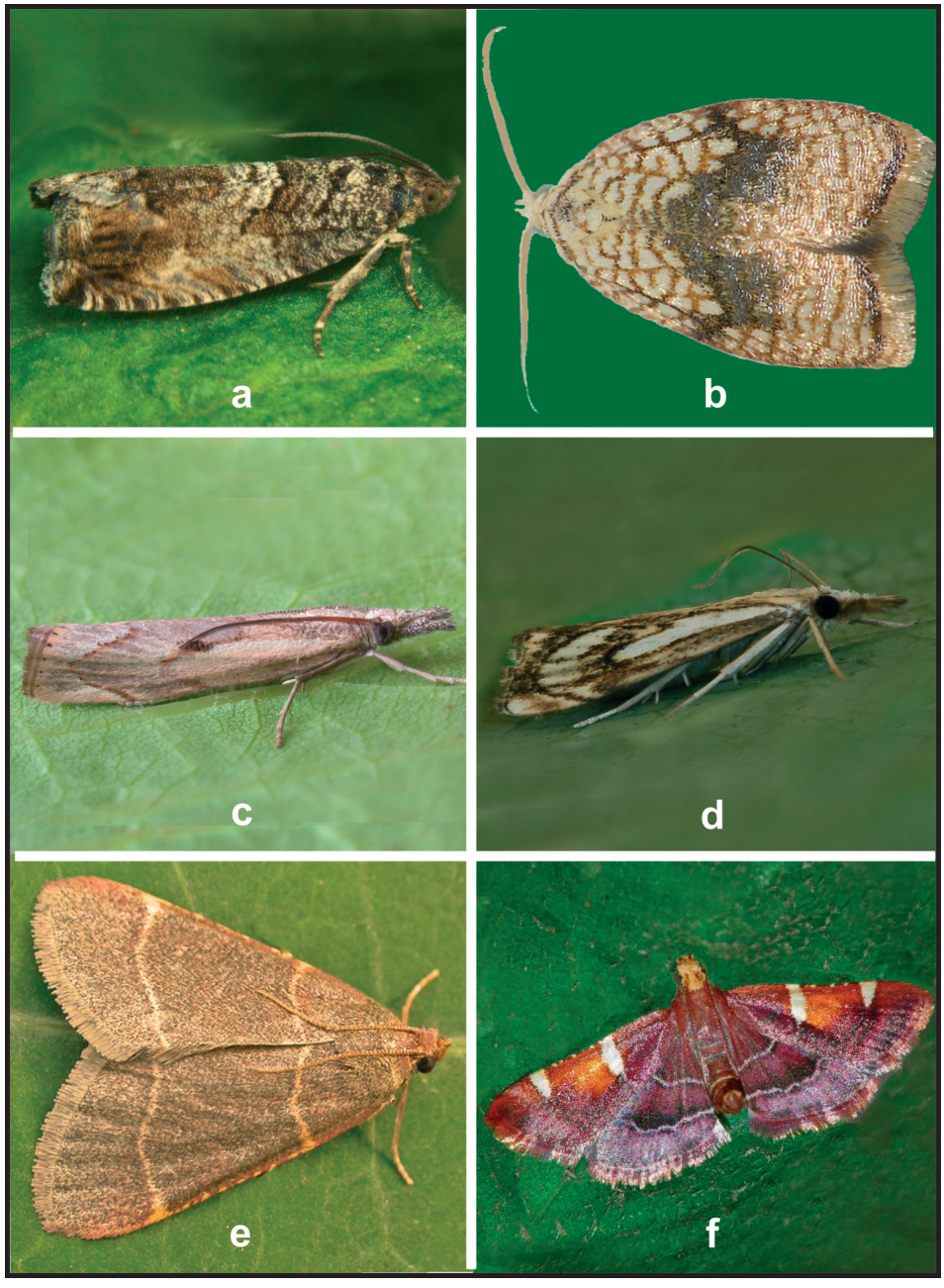


Fig. 10: Adult of species: a) *Cydia fagiglandana* (Zeller, 1841), b) *Croesia forsskaleana* (Linnaeus, 1758), c) *Agriphila inquinatella* ([Denis & Schiffermüller], 1775), d) *Catoptria falsella* ([Denis & Schiffermüller], 1775), e) *Orthopygia glaucinalis* (Linnaeus, 1758), f) *Pyralis regalis* ([Denis & Schiffermüller], 1775)

Metasia ophialis (Treitschke, 1829)

Material examined: 1 ex, Croatia, Zadar, 29.07.1989, leg. Ábrahám L. – larva and hostplant unknown. Univoltine: from June to late September. Nominate species widely distributed in Hungary, xerothermophilous, preferring sandy soils or limestone. Rare and very isolated populations in Bohemia (Brno), S Slovakia, Austria (only in Steiermark), Romania. The data from Balkan incomplete (GANEV 1984). According to KLIMESCH (1968), known in other areas in Balkans, but the Serbian researchers (JAKŠIĆ & MIHAILOVIĆ 1996), recently reported it from a very small area. The occurrence in the Western Europe needs confirmation. The species was found in 2004 in Belgium (SPRONCK, GEORIS 2009). According to author's "La biologie de *Metasia ophialis* est inconnue mais cette espèce a une période de vol s'étalant de juin à septembre. Elle fréquente les endroits et calcaries."

Acknowledgements

Levente Ábrahám (H-Kaposvár) and Kálmán Szeőke (H-Székesfehérvár) are thanked for their examination of specimens. I am grateful to my colleague Barry Goater (GB-Chandlers Ford) for the correction of my English.

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DOI:10.24394/NatSom.2009.15.195 | Natura Somogyiensis | 15 | 195-202 | Kaposvár, 2009

Distribution of *Oporopsamma wertheimsteini* (Rebel, 1913) in Central Europe (Lepidoptera: Tortricidae)

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Fazekas, I. & Lesar, T.: *Distribution of Oporopsamma wertheimsteini (Rebel, 1913) in Central Europe.*
Abstract: Data are reported on the geographical distribution of *Oporopsamma wertheimsteini* (Rebel, 1913) in Central Europe. Structure of genitalia and morphological characteristics of wings are illustrated by figures. The habitats and Central European distribution of the species are described. With 5 figures.

Keywords: Lepidoptera, Tortricidae, Oporopsamma wertheimsteini, distribution, biology, C Europe.

Introduction

Oporopsamma Gozmány, 1954 a monotypical genus. All veins present except for hindwing M1, Rs–M1 separate. According to Razowski (2002) sexual dimorphism moderate, expressed mainly in shape of forewing which in female is more narrow, more acute than in male. *Oporopsamma wertheimsteini* is a West Palaearctic species, known from Azerbaijan to Pannon biogeographical region, where it is at the western limit of its range. Little information has been given until now on the status of *O. wertheimsteini* in Europe (Razowski 1959, 1987, 1991, 2001, 2002). It is known mainly in Hungary (Gozmány 1954) with scattered localities in Slovakia (Hrubý 1964) and Slovenia (Lesar & Habeler 2005, Lesar & Verovnik 2008). A summary of recent distribution of the species in Hungary was given by Fazekas (2009). Here, we provide details of a study of the species in a Central European locality. We describe the habitats and we sketch the distribution map.

Abbreviations used: IV–IX: abbreviations of months; ex: exemplar; gen. prep: genital preparation; lt: light trap.
Names of institutions and private collectors: HNHM: Hungarian Natural History Museum, Budapest; SZ= Mr. Csaba Szabóky, H-Budapest; HGY= Mr. Gyula Horváth, H-Győr.
Hungarian names: – homokbuckás: sand dune, – nádas: reedy, – arborétum: arboretum, – fenyves-nyáras: pinewood-poplar plantation, – borókás: juniper, – botanikus kert: botanical garden.

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

Results

Oporopsamma wertheimsteini (Rebel, 1913)

Cnephasia wertheimsteini Rebel, 1913: Rovartani Lapok 20: 228. Type locality: Csételek [Cséhtelek, RO-Ciutelec], 7. VIII. [18]90, (RAZOWSKI 1959). Synonymy: *Oxypteron amseli* Razowski, 1957.

References – BUSCHMANN 2004; FAZEKAS 2009; GOZMÁNY 1954, 1983; HRUBÝ 1964; KARSHOLT & RAZOWSKI 1996; LESAR & HABELER 2005; LESAR & VEROVNIK 2008; OBRAZTSOV 1956; PASTORÁLIS 2007; RAZOWSKI 1959, 1987, 1991, 2001, 2002.

Diagnosis – ♂ ♀ wingspan 18.5–22.5 mm. Forewing ground colour grey, partly whitish, in places more less suffused with pale brownish and with blackish or brown dots. Typical markings brownish, consisting of indistinct basal blotch, concave proximally media fascia and faint apical and terminal suffusions. Hindwing ground colour whitish grey, cilia whitish or brownish white. Uncus of male genitalia short, socius slender and gnathos absent. Sacculus large and valva broad basally, with outer sclerotized pocket post-basally. Aedeagus slender, apex sharp. Sterigma of female genitalia slender and with reduced anteostial part. Bursa copulatrix without sclerites.

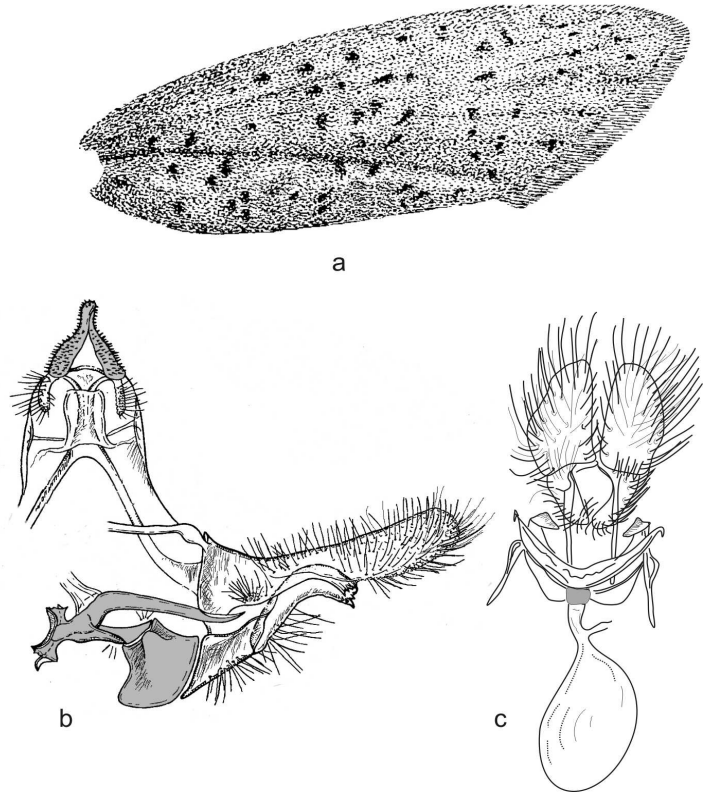

Fig. 1: Forewing (a), male (b) and female genitalia (c) of *Oporopsamma wertheimsteini* (Rebel, 1913) according to FAZEKAS (2009)

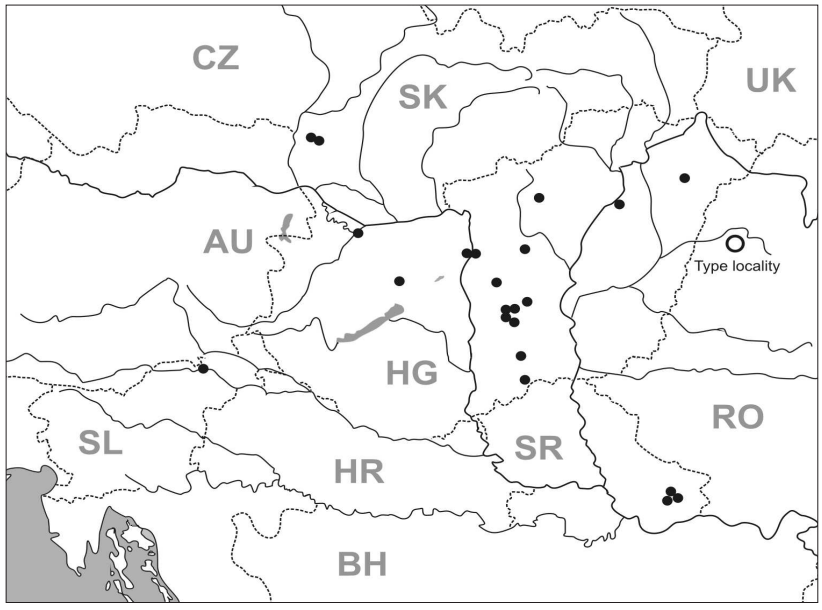

Fig. 2. Distribution of *Oporopsamma wertheimsteini* (Rebel, 1913) in Central Europe (del. Fazekas).

Biology – Larva (IV–V) monophagous on *Chondrilla juncea* L. According to authors (KUZNETZOV 1994, RAZOWSKI 2002) older larvae may be reared on salad and some Asteraceae. Pupation in feeding place where larvae aestivate; hibernation in egg stage. Univoltine species, the moths flying from late August to early October.

Distribution – Widely distributed from Iran, central Asia, Asia Minor and to Balkans, and in favourable localities in Hungary, Slovakia and Slovenia.

Range in Hungary

Examined material (according to the original writing): 11 ex, Ágasegyháza, homokbuckás, 1953. IX. 21. (leg. Dr. Gozmány, gen. prep. 61, Gozmány, in coll. HNHM); – 1 ex, Ágasegyháza, nádas, 1954. IX. 28. (leg. Dr. Éhik, in coll. HNHM); – 2 ex, Ágasegyháza, homokbuckás, 1958. IX. 13. (leg. Dr. Gozmány, in coll. HNHM); – 2 ex, Budatétény, 1960. IX. 18–19. (leg. lt, in coll, HNHM); – 4 ex, Bugac, Felsőmonostor, 2000. 09. 07., 2002. 08. 28., 2003. 09. 06., 2005. 09. 16. (leg. Szabóky Cs., in coll. SZ); – 2 ex, Győrszentiván, 1993. and 1994. 09. 13. (leg. Horváth Gy., in coll. HGY); – 1 ex, Fülöpháza, KNP bemutatóháza (a volt iskola) 2005. 09. 12. (leg. Szabóky Cs., in coll. SZ); – 1 ex, Hortobágy, Újszentmargita, 1974. IX. 23–25. (leg. Vásárhelyi T. és Mahunka S., in coll. HNHM); – 1 ex, Kállósemjén, 1959. IX. 20. (leg. lt, in coll. HNHM); 1 ex, – Kecskemét, arborétum 2003. 09. 11. (leg. Szabóky Cs., in coll. SZ); – 1 ex, Királyszállás, 1933. IX. 22. (leg. Erdős, in coll. HNHM); – 7 ex, Kecskemét, Miklóstelep, 1961. IX. 7, 17, 18. (4 ex), 1963. IX. 10. (1 ex), 1964. IX. 16. (6 ex), 1964. IX. 18. (1 ex), 1964. IX. 27. (1 ex), 1964. IX. 27. (1 ex) (leg. lt, in coll. HNHM); – 1 ex, Kiskunhalas, 1939. IX. 17. leg. Szent-Iványi (gen. prep. 4. Gozmány 1952); – 2 ex, Kiskunság NP, Fülöpháza, homokbuckás, 1978. IX. 11. leg. (leg. Sin K. és Mészár Á., in coll. HNHM); – 1 ex, Mátra, Sár-hegy, 1997. 09. 29. (in coll. MM); – 2 ex, KNP Bugac, fenyves-nyáras, 1979. VIII. 23. (leg. Gozmány, Vojnits, Sin, in coll. HNHM); – 1 ex, KNP, Bugac, 1979. IX. 23–25. (leg. Gozmány L., Ronkay L., Papp J., in coll. HNHM); – 1 ex, Nagykáta, Cseh-domb, 2001. 09. 21., (in coll. MM); – 5 ex, Örkény, borókás, 2000. 09. 05., 11., 2002. 09. 07., 2004. 09. 17. (leg. et coll. SZ); – 4 ex, Soroksár, botanikus kert, 2005. 09. 12., 2006.09. 14., 17. (leg. Szabóky Cs. in coll. SZ); – 1 ex, Tompa, Alsósáskalapos, 1964. IX. 14, lt, 1 ex, 1974. IX. 23. (leg. lt, in coll. HNHM).

O. wertheimsteini is a rare species with very isolated populations in Hungary. Occurs very locally in Great Hungarian plain (a.s.l.m. 75–200 m), and sporadically in some habitats of moderate altitude in the mountains (Transdanubian Mountains; a.s.l.m. 200–756 m). Further west, it is unknown in most other countries. A xerothermophilous species, in Hungary the typical habitats where the moths fly are open sand steppes and lowland dry degraded grasslands, on secondary in rock- and slope steppes and in arboreta and botanical gardens. In the Hortobágy National Park it is found on the extensive grassy "pusztae" and steppe-like grasslands mainly on saline substrata, and the less extensive marshes and lakes as well as the two largest remaining original oak woods. This habitat is unique, not only in Hungary but also in other parts of Central Europe, and a similar vegetational complex occurs, at the nearest, only beyond the Volga desert in the Russia. According to GOZMÁNY (1983), the species is characteristic of sandy areas in the Great Plain in Hungary and the adjoining areas of Romania (Transylvania and the Deliblat desert).

Range in Slovakia

Examined material: According to G. Pastorális (in litt.) little specimen from Záhorská nížina, Šaštín-Stráže desert; 1♀ 20.09.1957. leg. Schwarz, in private coll. Liška (Praha, CZ).

RAZOWSKI (1959) published data earlier from this region, but there are no more recent records. The species is apparently very rare and local in Slovakia, but could he overlooked and therefore careful search is required. The Slovakian populations are a long distance from those in the Hungary. Gene flow in uncertain; the species may be in regression and endangered in Slovakia. The habitat is identical to that in Hungary (see Fig. 4b); locally extensive sand dunes and pannonic sand steppes. There are similar habitats in central Hungary, mainly in Kiskunság National Park.

Range in Slovenia

Examined material: 1 ex Spodnje Konjišče on Mura River, 2006. X. 27. (leg. Lesar, Jež, coll. Lesar).

Rare species, known only from this specimen. The habitat is lowland mixed woodland on the right bank of the Slovenian-Austrian-border-river Mura. This part of North-East Slovenia belongs to the subpannonian region so the occurrence of this species there was not a very great surprise and further findings in the area are to be expected. At present, this is the most westward known point of its distribution in Central Europe. The species is new for Slovenia (LESAR & VEROVNIK 2008) and was unknown there in 2005, so it is not included in the List of Microlepidoptera for North-East Slovenia (LESAR & HABELER 2005).

Acknowledgements

We thank Gabriel Pastorális (SK-Komárno) Jan Liška (CZ-Praha), Zsolt Bálint (H-Budapest, Hungarian Nat. Hist. Mus.), Csaba Szabóky (H-Budapest) for information on the geographical distribution of the species and František Slamka (SK-Bratislava) is thanked for the photo from Slovakia. Barry Goater (GB-Chandlers Ford) corrected the English language of the manuscript. We are grateful to all for their help.

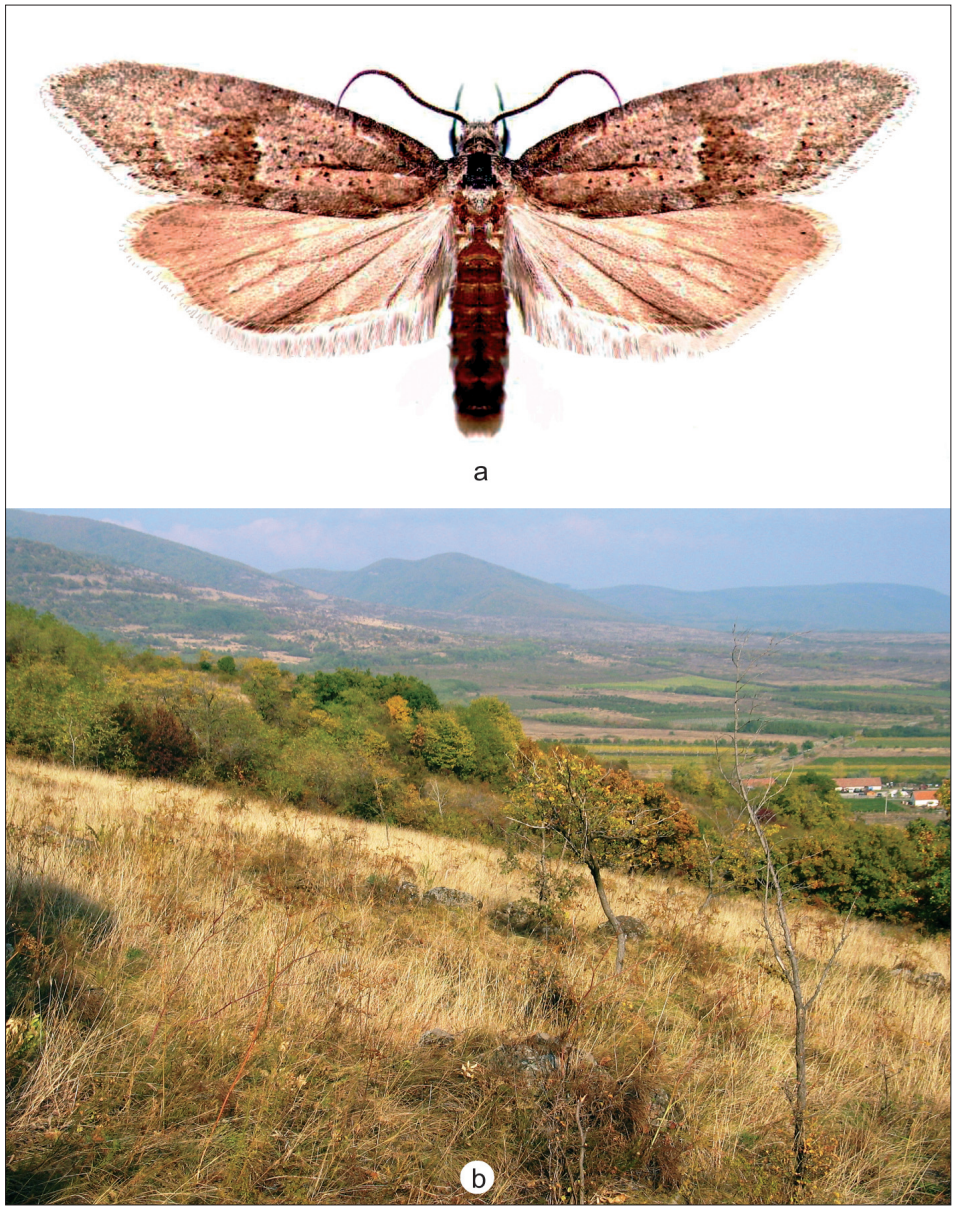

Fig. 3: Adult (a) and habitat (b) of *Oporopsamma wertheimsteini* (Rebel, 1913): a) H-Győrszentiván (photo Gy. Horváth); b) H-Gyöngyös, Sár-hegy, sub-pannonic steppic grasslands (photo: T. Baranyi).

Fig. 4. Habitat of *Oporopsamma wertheimsteini* (Rebel, 1913):
a) Hungary, Örkény (photo: G. Pastorális); b) Slovakia, Šaštín–Stráže (photo: F. Slamka).

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DOI:10.24394/NatSom.2009.15.203 | Natura Somogyiensis | 15 | 203-212 | Kaposvár, 2009

Partifecske (*Riparia riparia*) állományfelmérések a Dráva-mentén, 2000-2008 között

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FENYŐSI, L.: *Sand Martin (Riparia riparia) population surveys along river Drava between 2000-2008.*
Abstract: This study summarizes the results of Sand Martin (*Riparia riparia*) population surveys along river Drava. The investigations started in 2000, along the 67 kilometre long river section stretching from Bélavár to Szentborbás (199-132 river kilometres), with the aim of following population trends of Sand Martins (*Riparia riparia*). During the survey, the number of breeding pairs was established by taking 60% of the number of nest holes counted (SZÉP 1991). The size of the breeding population along the 67 km long reach between Bélavár and Szentborbás numbered 2370 pairs in 2000 which then decreased to 1116 pairs in 2002. Population size in the sample area then reached its peak with 3489 pairs in 2006, then dropped significantly again. The difference between the largest and smallest population size is more than threefold. Within the period of 2000-2002 the highest proportion of nest colonies was those with less than 200 nest holes (72.8%, 62.5% és 84.6%), in 2003-2006 those with more than 200 nest holes (62.5%, 62.5%, 57.2% és 77.77%), and in 2007-2008 again those with less than 200 nest holes (74.97% és 66.66%). Besides these monitoring studies, from 2003 we extended our surveys onto the entire common Croatian-Hungarian Drava section (237-70.5 river km) and onto two nearby sand pits. Thus, with these data, the number of breeding Sand Martin pairs in the surveyed areas was 3786 in 2003, 3788 in 2004, 4125 in 2005, 4729 in 2006, 4806 in 2007, and 3333 in 2008. We have found that both the size of the breeding population and breeding success are influenced predominantly by water levels of the Drava. Flood waves and high water periods within the breeding season (May-June) can wash away nest holes or even colonies that are located lower down, as was observed most strikingly in 2004 and 2008.

Keywords: Bird, Aves, Sand Martin, *Riparia riparia*, Drava, Hungary

Bevezetés

A Dráva-folyót kísérő természetes partfalak fészkelői - *Riparia riparia, Merops apiaster* és *Alcedo atthis* - jelentős természeti értéket képviselnek. A fészkelő-állományok feltérképezése az utóbbi években kezdődött meg, e dolgozatban a 2000-2008 között végzett partifecske (*Riparia riparia*) állományfelmérések eredményeit foglaljuk össze.

Az e térségből származó első munkákban (VASVÁRI 1937, MARIÁN 1958, KÁRPÁTI 1979, MARIÁN és PUSKÁS 1985, BANK 1989, FENYŐSI 1993) drávai vonatkozások alig találhatók. Az 1990-es évektől már megszaporodtak a Dráva madárvilágával foglalkozó írások (pl. FENYŐSI 1996, FENYŐSI 1998, PURGER 1998, PURGER és FENYŐSI 2001, FENYŐSI 2002), azonban a partfalak telepesen fészkelő madarairól így is kevés adatot találunk. FENYŐSI (1996) az 1983-1996 közötti időszak Somogy-megyei drávai megfigyeléseit foglalja össze, s e munkában 16 rendbe sorolt 108 madárfaj előfordulását

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

bizonyítja, továbbá adatokat közöl a jégmadár és gyurgyalag költőállományához. A Dráva horvát területéről említ egy 400 páros telepet RADOVIC (1996). A szlovén Dráva partifecske-állományáról adatokat találunk BRACKO és STUMBERGER (1995) írásában. A Dráva-folyó 199-132 fkm-ek közötti szakaszán 2000-2003-ban végzett partifecske állományfelmérések eredményeit FENYŐSI (2003) foglalja össze.

Anyag és módszer

A vizsgált terület a Dráva Őrtilos-Matty közötti, 167 folyamkilométer hosszúságú szakasza. E szakasz Őrtilos-Drávatamási közötti területei a Belső-Somogyhoz sorolt Közép-Dráva-Völgy kistáj részei. A kistáj a folyó balpartját 1-4 km szélességben kíséri, s jellegzetes elemei a zegzugos futású, helyenként 30 m magasságot is elérő magaspartok. A terület mérsékelten meleg, nedves éghajlatú. Az évi középhőmérséklet 9,7-10,2 *C, az éves csapadék mennyisége 780-800 mm. A folyó Drávatamási-Matty közötti szakasza a Drávamenti-síkság, illetve a Dráva-sík kistáj része. A szinte tökéletes síkságnak minősülő terület éghajlata kissé melegebb és szárazabb az előzőnél. A Dráva-folyó szélessége a vizsgált területen 150-400 m közötti, mélysége többnyire 3-4 m. A folyó gyors vízjárású, sebessége 0,3-1,9 m/s, esése Bélavár határában még jelentős (35 cm/km). Vízjárásában nagyvízi időszak május-júniusban és október-novemberben figyelhető meg. Kisvizek nyárvégen és december-februárban jellemzőek. A magyar-horvát államhatár a somogyi folyószakaszon csak ritkán halad a sodorvonalon, természetes kanyarfejlesztések, átvágások és helyenként politikai okok miatt gyakoriak a bal parti horvát, illetve a jobb parti magyar területek.

2000-től a Dráva 199-132 fkm-ek közötti szakaszán felméréseket végeztünk a partfalfészkelő fajokon. A vizsgálatok során három fajról - *Merops apiaster, Alcedo atthis* és *Riparia riparia* - gyűjtöttünk adatokat, de e tanulmányban csak a *Riparia riparia* állomány-felmérésekről kívánunk beszámolni. Vizsgálatunk célja a Bélavártól Szentborbásig terjedő, 67 fkm-es szakasz mentén élő partifecskék (*Riparia riparia*) állományváltozásainak nyomonkövetése volt. A monitoring-vizsgálatok mellett később felméréseinket egyre nagyobb területen folytattuk, így 2007/2008-ra már a Dráva 237-70,5 fkm-ek közötti teljes horvát/magyar szakaszán és két közeli homokbányában végeztünk állományfelvételezést. A folyón évente június-július hónapokban csónakból végeztük a felméréseket, ekkor feljegyeztük a fészektelepek helyét, függetlenül attól, hogy magyar, vagy horvát területen találhatóak. A terület ismeretében kijelenthetjük, hogy a mellékágakban gyakorlatilag nem alakulnak ki telepes költésre alkalmas falfelületek. A telepeken a fészeküregeket megszámoltuk, s nagyobb telepek esetében a számolást fotóról még visszaellenőriztük. A költőpárok számát az üregek számlálásával kapott eredmény 60%-a adja (SZÉP 1991).

Eredmények

Monitoring vizsgálat a Bélavár-Szentborbás (199-132 fkm) közötti Dráva-szakaszon

A 2000. évi felméréskor a 199-132 fkm-ek közötti Dráva-szakaszon 12 telepen 3950 üreget számoltunk (1. táblázat). A fészkelőüregek száma alapján a költőpárok száma:

1. táblázat: Partifecske (*Riparia riparia*) fészeküregek száma a Dráva 199-132 fkm-ek közötti szakaszán, 2000-2008-ban

		Riparia riparia fészeküregek száma (db)								
ssz.	**Hely**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
1.	197,5 fkm (bal part)	-	-	-	20	-	-	-	80	-
2.	195 fkm (jobb part)	-	-	60	-	-	-	-	-	120
3.	191 fkm (jobb part)	-	-	-	300	-	-	50	-	50
4.	190 fkm (jobb part)	340	120	-	-	9	-	-	-	-
5.	190 fkm (bal part)								160	-
6.	189,7 fkm (jobb part)	-	-	150	-	-	-	-	-	-
7.	189,5 fkm (bal part)						350	-	-	-
8.	188 fkm (bal part)	50	500	580	550	1000	850	2130	1500	600
9.	187,8 fkm (bal part)	-	-	-	-	-	-	950	-	-
10.	185 fkm (jobb part)	-	-	10	-	-	-	-	60	-
11.	184-85 fkm (bal part)	1900	1200	300	1110	570	1250	855	320	450
12.	183,5 fkm (bal part)	-	-	-	-	-	20	650	-	-
13.	181,5 fkm (bal part)	-	-	-	-	-	100	-	-	-
14.	181 fkm (bal part)	150	-	-	-	-	-	370	250	30
15.	180,5 fkm (bal part)	-	-	140	230	110	-	-	-	-
16.	179-178 fkm (jobb part)	80	-	120	-	-	-	20	30	-
17.	177,5 (bal part)	-	40	200	860	585	1500	290	80	120
18.	177 fkm (bal part)	1100	500	200	180	400	-	500	85	1200
19.	173 fkm (bal part)	30	-	-	-	-	30	-	50	50
20.	171 fkm (jobb part)	-	20	-	-	-	-	-	40	50
21.	161 fkm (bal part)	-	-	-	-	5	-	-	-	-
22.	148 fkm (jobb part)	150	80	30	-	-	-	-	20	-
23.	146 fkm (jobb part)	10	-	20	-	-	-	-	-	-
24.	144-43 fkm (bal part)	40	-	20	15	-	-	-	-	-
25.	141 fkm (bal part)	-	-	-	-	300	-	-	-	-
26.	138,2 fkm (jobb part)	100	80	-	-	-	-	-	-	-
27.	138 fkm (jobb part)	-	-	30	-	-	-	-	-	-
	Összesen:	**3950**	**2540**	**1860**	**3265**	**2979**	**4100**	**5815**	**2675**	**2670**

2. táblázat: Partifecske (Riparia riparia) fészeküregek száma 2003-2008 között, a Dráva 237-199 és 132-70 fkm-ek közötti szakaszán, illetve a barcsi és bélavári bányáknál

		fészeküregek száma (db)					
ssz.	**Hely**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
1.	234 fkm (jobb part)	100	40	-	330	720	-
2.	233,5 fkm (jobb part)	-	30	-	100	-	720
3.	232 fkm (bal part)	-	-	-	-	320	-
4.	230,5 fkm (bal part)	-	-	-	-	-	120
5.	229,5 fkm (bal part)	-	-	250	-	-	-
6.	225,7 fkm (jobb part)	-	-	-	-	-	20
7.	225 fkm (jobb part)	-	30	-	-	400	180
8.	224,5 fkm (jobb part)	-	-	-	-	25	-
9.	223,5 fkm (bal part)	-	-	-	-	330	-
10.	223 fkm (jobb part)	10	-	-	240	-	-
11.	222,6-222,7 fkm (bal part)	200	660	-	70	-	-
12.	222 fkm (jobb part)	30	-	130	-	-	20
13.	221,5 fkm (bal part)	-	-	35	-	-	150
14.	221 fkm (jobb part)	500	330	-	-	700	40
15.	220,3-220,6 fkm (jobb part)	-	-	420	-	-	-
16.	216,5-217,2 fkm (bal part)	-	-	210	30	350	220
17.	215,5-216 fkm (jobb part)	-	1000	250	-	-	-
18.	215 fkm (jobb part)	250	180	150	-	70	-
19.	209 fkm (jobb part)	10	-	-	-	-	-
20.	208,4 fkm (bal part)	40	40	-	-	80	-
21.	206,5 fkm (bal part)	50	80	100	-	60	-
22.	205 fkm (bal part)	-	-	-	10	-	-
23.	111 fkm (bal part)	-	-	-	-	-	115
24.	108-107 fkm (jobb part)	-	-	-	-	155	-
25.	100 fkm (jobb part)	-	-	-	-	20	-
26.	98 fkm (jobb part)	-	-	-	-	780	-
27.	97 fkm (jobb part)	-	-	-	-	45	-
28.	93,7 fkm (jobb part)	-	-	-	-	-	110
29.	87,5 fkm (jobb part)	-	-	-	-	-	210
30.	87 fkm (jobb part)	-	-	-	-	-	20
31.	84,5 fkm (jobb part)	-	-	-	-	-	120
32.	Csíkos, bányagödör	35	25	80	100	180	160
33.	Viktorpuszta, homokbánya	1820	920	1150	1200	1100	680
	Összesen:	**3045**	**3335**	**2775**	**2080**	**5335**	**2885**

2370 pár. A legnagyobb telep Heresznye határában alakult ki, bal parti partfalban: 1900 fészeküreg.

2001-ben 8 telepen 2540 üreget számoltunk (1. táblázat). A fészkelőüregek száma alapján a költőpárok száma: 1524 pár. A legnagyobb telep ismét Heresznye határában alakult ki, de most csak 1200 fészeküreget számoltunk a bal parti partfalban.

2002-ben 12 telepen 1860 üreget számoltunk (1. táblázat). A fészkelőüregek száma alapján a költőpárok száma: 1116 pár. A legnagyobb telep szintén a Magaspartban alakult ki, azonban itt is mindössze 580 fészeküreget számoltunk.

2003-ban 8 telepen 3265 üreget számoltunk (1. táblázat). A fészkelőüregek száma alapján a költőpárok száma: 1959 pár. A legnagyobb telep a Bolhó-Heresznye határában található bal parti partfalban alakult ki: 1110 fészeküreg.

2004-ben 8 telepen 2979 üreget számoltunk (1. táblázat). A fészkelőüregek száma alapján a költőpárok száma: 1787 pár. A legnagyobb telep ismét a heresznyei magaspartban alakult ki: 1000 fészeküreg.

2005-ben 7 telepen 4100 üreget számoltunk (1. táblázat). A fészkelőüregek száma alapján a költőpárok száma: 2460 pár. A legnagyobb telep ez évben a Bolhó-Babócsa határában található bal parti partfalban alakult ki: 1500 fészeküreg.

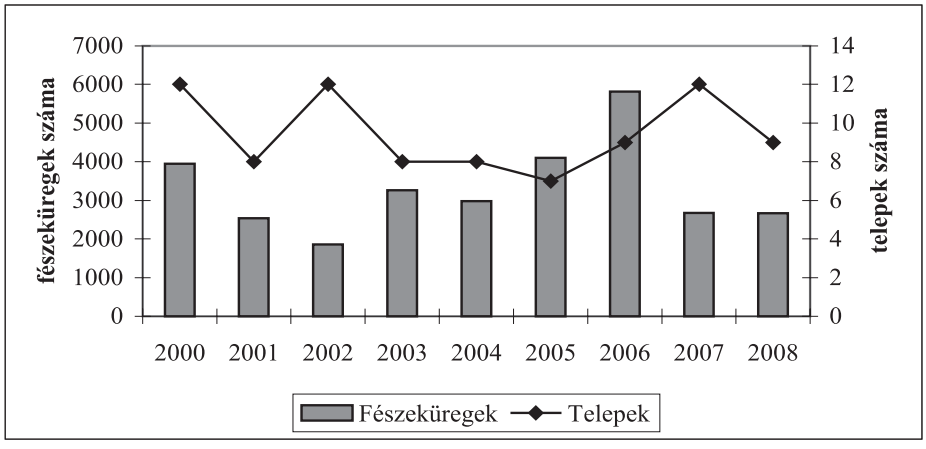
2006-ban 9 telepen 5815 üreget számoltunk (1. táblázat). A fészkelőüregek száma alapján a költőpárok száma: 3489 pár. A legnagyobb telep ez évben a heresznyei Magaspartban alakult ki: 2130 fészeküreg.

2007-ben 12 telepen 2675 üreget számoltunk (1. táblázat). A fészkelőüregek száma alapján a költőpárok száma: 1605 pár. A legnagyobb telep ez évben a heresznyei bal parti Magaspartban alakult ki: 1500 fészeküreg.

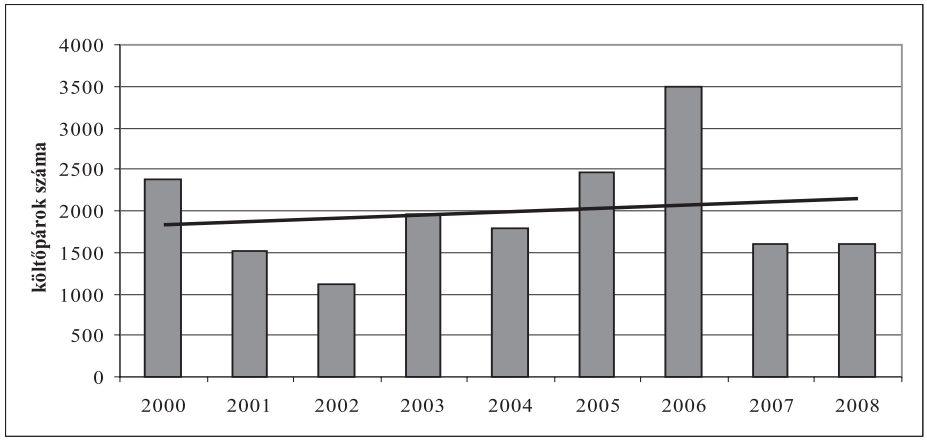
2008-ban 9 telepen 2670 üreget számoltunk (1. táblázat). A fészkelőüregek száma alapján a költőpárok száma: 1602 pár. A legnagyobb telep ez évben a Bolhó-Babócsa határában található bal parti partfalban alakult ki: 1200 fészeküreg.

A Dráva 199-132 fkm-ek közötti szakaszán a 2000-2008. években a partifecske (*Riparia riparia*) telepek és a fészeküregek száma az 1. ábra szerint változott. Így, a 67 fkm-es folyószakaszon a telepszám 7-12 között, a fészeküregek száma 1860-5815 között változott. A vizsgált időszakban a költőpárok száma a 2. ábrán látható módon alakult: 1116-3489 pár között változott. Az állománynagyság változására pozitív trend volt a jellemző (2. ábra).

A telepméretek fészeküregek száma szerinti megoszlását a 3. ábra mutatja. Az ábrát vizsgálva láthatjuk, hogy a vizsgált időszak első három évében - 2000-2002-ben - a 200 fészeküreg-szám alatti telepek összesített aránya volt magasabb (72,8%, 62,5% és 84,6%), majd a 2003-2006. években a 200 fészeküreg-szám feletti telepek összesített aránya lett a meghatározó (62,5%, 62,5%, 57,2% és 77,77%). A 2007-2008. évben újra a 200 fészeküreg-szám alatti telepek összesített aránya volt magasabb, 74,97% és 66,66%. Bár a vizsgált területre jellemzőek a kisebb telepek, a partifecske-állomány döntő hányada egyes években alig néhány telepben fészkelt: pl. 2000-ben 2 telepben 1800 pár (az állomány 75,9%-a), 2003-ban 3 telepben 1512 pár (77,1%), illetve 2005-ben 3 telepben 2160 pár (87,8%). Mindez, a nagyobb telepek fokozott védelmére hívja fel a figyelmet.



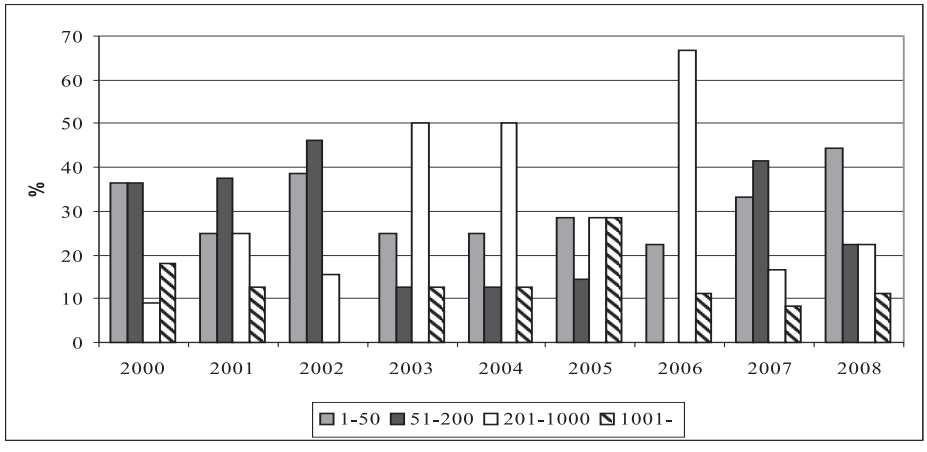
1. ábra: A telepek és fészeküregek számának alakulása a Dráva 199-132 fkm-ek közötti szakaszán



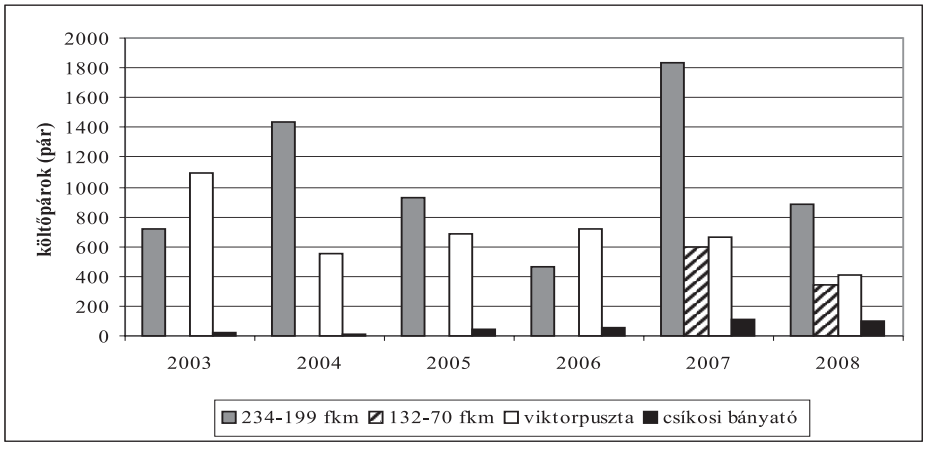
2. ábra: A költőpárok számának alakulása a Dráva 199-132 fkm-ek közötti szakaszán

További állományfelmérések a Dráva-mentén, 2003-2008 között

A Dráva 199-132 fkm-ek közötti mintaterületén végzett felvételezéseket 2003-tól kiegészítettük 3 újabb területen - a Dráva 237-199 fkm-ek közötti szakaszán, továbbá a viktorpusztai homokbányában és a bélavári bányatónál - végzett felmérésekkel, hogy a Dráva-menti térség R. riparia állományáról teljesebb képet kaphassunk. 2007-2008-ban újabb területen - a folyó 132-70 fkm-ek közötti szakaszán - is felmérést végeztünk a teljes Dráva-menti térség partifecske-állományának megismeréséhez. Mindezen felmérések összesített eredményeit a 2. táblázat tartalmazza. E táblázat szerint 2003-ban 11 telepen 3045, 2004-ben 11 telepen 3335, 2005-ben 10 telepen 2775, 2006-ban 8 telepen 2080, 2007-ben 16 telepen 5335 és 2008-ban 15 telepen 2885 fészeküreget számoltunk. E négy területen - a Dráva 237-199 fkm-ek és 132-70 fkm-ek közötti szakaszán, továbbá



3. ábra: A telepnagyságok fészeküreg-szám szerinti megoszlása a Dráva 199-132 fkm-ek közötti szakaszán

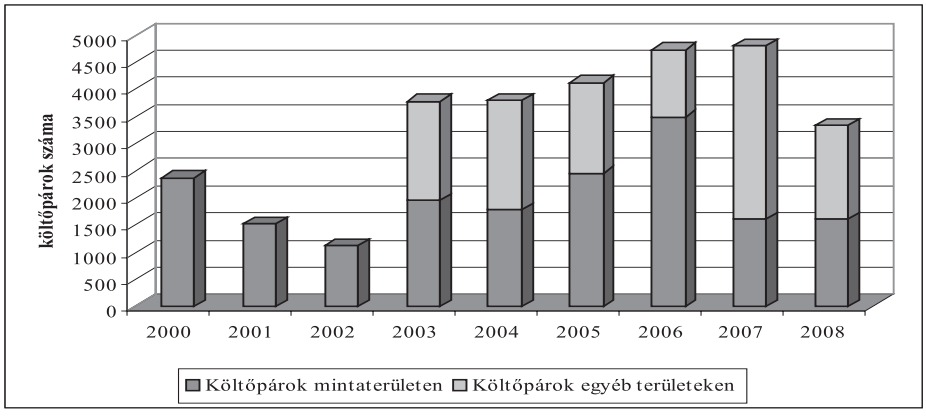


4. ábra: Partifecske (*Riparia riparia*) költőpárok számának alakulása a Dráva 237-199 és 132-70 fkm-ek közötti szakaszán, illetve a barcsi és bélavári bányáknál, 2003-2008 között

a viktorpusztai homokbányában és a csíkosi bányatónál - 2003-2008-ban a költőpárok száma a 4. ábra szerint alakult. Az ábrán látható, hogy a költőpárok száma e területeken 2007-ben (3201 pár) és 2004-ben (2001 pár) volt a legmagasabb.

A felmérések összesített eredményei

Az 5. ábrán a mintaterületen és az egyéb területeken végzett számlálások összesített eredményeit láthatjuk. Az oszlopok sötét színnel jelzett része a mintaterület, világos színnel jelzett része az egyéb területek állománynagyságát (a költőpárok számát) mutatja. Az ábrát vizsgálva látható, hogy míg a mintaterületen az állománynagyság jelentős ingadozást mutat (több, mint háromszoros értékkülönbség), a teljes Dráva-menti térség esetében már kiegyenlítődés tapasztalható (kisebb, mint másfélszeres értékkülönbség).



5. ábra: A partifecske (*Riparia riparia*) állomány alakulása a Dráva 199-132 fkm-ek közötti mintaterületén (sötét oszlop), illetve egyéb területeken, a Dráva 237-199 és 132-70 fkm-ei között, továbbá a barcsi és bélavári bányáknál (világos oszlop)

Következtetések

A Bélavár-Szentborbás közötti 67 fkm-es Dráva-szakaszon 2000-ben a partifecske fészkelőállomány 2370 pár volt, ez 2002-re 1116 párra csökkent. Ezt követően a mintaterületen az állománynagyság 2006-ban érte el a maximumot, 3489 párat, majd újra jelentősen csökkent. A legkisebb és legnagyobb állománynagyság közötti különbség több, mint háromszoros. A költőállomány 2000-2002 közötti drasztikus csökkenésének, illetve a 2002-2006 közötti jelentős növekedésének okát nem ismerjük. A 2003-ban megkezdett és nagyobb térségre kiterjedő vizsgálataink alapján feltételezzük, hogy a mintaterületen megtelepedő fecskepárok számát is elsősorban a térségen belüli fészkelőhely-váltások befolyásolják. A 2. ábrán feltüntetett telepnagyságokat vizsgálva látható, hogy a 200 pár alatti telepek száma ugyan relatíve magas, ennek ellenére minden évben 1-2 nagyobb telepen fészkelt a fecskék 40-75%-a. Ez a tény a nagy telepek fokozott védelmére hívja fel a figyelmet.

A 2003-tól további területeken végzett felméréseknek köszönhetően 2007-2008-ban már gyakorlatilag a Dráva-folyó teljes magyar/horvát szakaszáról (237-70 fkm-ek) és két anyagbányából vannak adataink, így elmondhatjuk, hogy 2003-ban e Dráva-menti térségben 3786, 2004-ben 3788, 2005-ben 4125, 2006-ban 4729, 2007-ben 4806 pár és 2008-ban 3333 pár partifecske fészkelt.

Tapasztalataink szerint az állománynagyságot és a költési sikerességet jelentősen befolyásolja a Dráva vízállása. A fészkelési időben (május-júliusban) kialakuló árhullámok és magas vízállások elmossák az alacsonyabban lévő telepeket és költőüregeket, ez különösen 2004-ben és 2008-ban volt megfigyelhető. Ilyen években jellemző, hogy júliusi bejáráskor már több, májusban még fellelt telepet nem lehetett megtalálni.

Fontosnak tartjuk megjegyezni, hogy vizsgálataink során a költőpárok számának megállapításánál a szakirodalomból ismert megoldást választottuk, a fészeküregek számának 60 %-át tekintjük fészkelőpárnak (SZÉP 1991).

Köszönetnyilvánítás

Köszönöm a felvételezésekben nyújtott nélkülözhetetlen segítségét Csór Sándornak. Esetenként Horváth Zoltán, Mezei Ervin és Sallai Zoltán segítette munkánkat. A vizsgálatokat a „Dráva Monitoring'' keretében a Duna-Dráva Nemzeti Park Igazgatóság is támogatta.

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DOI:10.24394/NatSom.2009.15.213 | Natura Somogyiensis | 15 | 213-218 | Kaposvár, 2009

A fehér gólya (*Ciconia ciconia*) állomány vizsgálata Dél-Somogyban, az 1991-2000. években

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Fenyősi, L.: *Survey on the population of white stork (Ciconia ciconia) in South Somogy county between 1991-2000.*
Abstract: In the course of 1991-2000, the author carried out a population survey of white stork in South Somogy county (1200 km^2). 46 villages and 22 farms were regularly checked by years. During the examination the number of breeding pairs (Hpa) were about 99-102 and 143-148, so the density (StD) were 8.25-12.33 pairs/100 km^2. There were the lowest the portion of successful breeding (HPm) (49.6%) in 1997, while the highest (83.3%) was in 1994. In 1996, 1994 and 2000, the total numbers of juveniles (JZG) were the highest. Between 1991-2000, the survey pointed out that 34.6% increasing in the percentage of nests.

Keywords: white stork, population survey, increasing trend

Bevezetés

Magyarországon - néhány korábbi felmérést követően - 1958-ban kezdődött meg az a felméréssorozat, melyben szakemberek és egyéb közreműködők öt évenként azonos módszerrel vizsgálják a hazai fehér gólya állományt. Somogy-megyében az első, már jelentős területet érintő állományfelmérés 1956-ban Marián Miklós szervezésében történt (Marián 1956). Az 1958, 1963 és 1968. évi felmérések eredményeit Marián (1971) publikálta, majd a megye gólyaállományának alakulásáról többek között Jakab (1978, 1986, 1989, 1991, 1992a, 1992b, 1993), Fenyősi (1994, 1998), Fenyősi és Horváth (2000), Hunyady (1994), László et. al. (1996) és Novotny et. al. (1995) munkáiban találunk adatokat. Mivel e megyében a felmérések különböző településeket érintettek, továbbá változott a felmérők személye és módszere, az adatok nehezen összevethetőek. Szerencsésebbek azok a vizsgálatok, melyeknél előbbi tényezők kiküszöbölhetők, s egy-egy nagyobb időszakot ölelnek fel (pl. Rékási és Jakab 1984). E céllal vizsgáltuk 1991-2000 között Dél-Somogyban egy 1200 km^2-es mintaterületen a fehér gólya állományát. A dolgozat az eredmények összegzését adja.

Anyag és módszer

A mintegy 6000 km^2 kiterjedésű Somogy hazánk legnagyobb kiterjedésű megyéi közé tartozik. Északon a Balaton, keleten a Külső-Somogyi dombvidék, a Kapostól délre a Zselicség, nyugaton a Marcali-lösszhát és a Csurgó-Zákányi dombság, a megye középső

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

és déli területein a Belső-Somogyi homokvidék terül el. A vizsgált terület nagyobb része a Belső-Somogyi homokvidékhez tartozik. A tengerszint feletti magasság 107-193 m közötti, az évi csapadék sokéves átlaga meghaladja a 700 mm-t. Jellemzőek az észak-déli irányú buckavonulatok, továbbá az ezek között meghúzódó vizes élőhelyek (láptavak, halastavak). A területet számos vízfolyás hálózza át, az erdősültség 27,5%-os. A Zselicség a megye legerdősültebb területe (cca. 30% erdősültség), tengerszint feletti magassága 140-300 m, az évi csapadék átlagos mennyisége 710 mm. A Csurgó-Zákányi dombság tengerszint feletti magassága 150-280 m, csapadékos (750 mm) és szubmediterrán hatásokat mutató éghajlattal, illetve magasabb erdősültséggel (28 %) jellemezhető. A vizsgált területen 46 községet, továbbá az ezekhez tartozó 22 majort, tanyát kerestünk fel. A terület kiterjedése 1200 km^2.

1991-ben - korábbi adatsorokra is támaszkodva - feltérképeztük a vizsgált területen található gólyafészkeket. Ezt követően évente július első hetében kerestük fel a fészkeket, s rögzítettük a következő adatokat: fészek helye, tartóaljzat, lakottság, fiókaszám. Területbejárás során az új fészkek gyakran már a tavaszi hónapokban előkerültek, majd később a települések átvizsgálásával pontosítottuk tovább adatainkat. Munkánk során külterületi fészkeket is találtunk, azonban ezek száma fokozatosan csökkent. A dolgozatban használt rövidítések jelentése a következő:

HX - lakatlan fészek
HE - magányos gólya
HPa - költőpár
HPm - eredményesen fészkelő költőpár
HPo - költőpár fióka nélkül
JZG - összes fiókaszám
JZm - sikeresen fészkelő párok fiókaátlaga
StD - sűrűség, pár/100 km^2

Eredmények

Az állományfelmérések során a gólyafészkek száma az 1. táblázatban megadottak alapján 107 és 164 között változott, melyből a lakatlan (HX) fészkek száma 3 és 31 közötti volt. Mivel a júliusi ellenőrzésekkor a meghiúsult költések (HPo) és a magányos gólya (HE) által lakott fészkek nem minden esetben különíthetők el, ezért ezeket együtt szerepeltetjük. A táblázat megadja az évente eredményesen fészkelő párok (HPm) számát is, e szempontból 1997 (56 pár) és 1996 (118 pár) jelenti a szélsőértékeket. A 2. táblázat foglalja össze a fészkenkénti fiókaszám változásait, továbbá az évenkénti összes fióka (JZG) számát is.

1. táblázat: A gólyafészkek számának alakulása a vizsgált területen

	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
HX	3	8	6	17	12	13	32	31	19	15
HPo + HE	40	19	25	20	50	33	57	29	45	33
HPm	64	90	98	100	91	118	56	99	94	107
Össz.:	**107**	**117**	**129**	**137**	**153**	**164**	**145**	**159**	**158**	**155**

2. táblázat: A fészkenkénti fiókaszám és az össz-fiókaszám változása 1991-2000 között.

	1991 (eset)	1992 (eset)	1993 (eset)	1994 (eset)	1995 (eset)	1996 (eset)	1997 (eset)	1998 (eset)	1999 (eset)	2000 (eset)
1 fióka	17	10	7	6	23	10	8	17	28	11
2 fióka	27	30	30	16	37	23	39	31	26	23
3 fióka	18	34	54	43	26	52	8	42	29	61
4 fióka	2	16	7	29	5	27	1	9	9	11
5 fióka	-	-	-	6	-	6	-	-	2	1
JZG	**127**	**231**	**257**	**313**	**195**	**350**	**114**	**241**	**213**	**289**

Értékelés

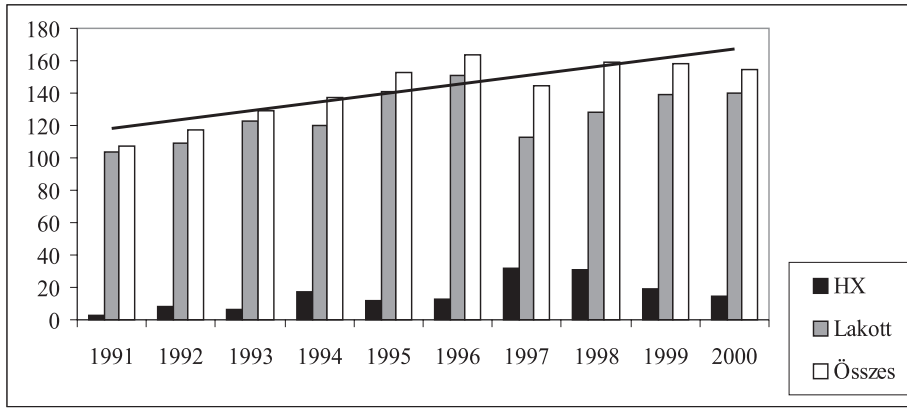
A vizsgált területen eredményeink alapján 1991-2000 között a fészkek száma 107 és 164 között, a lakott fészkek száma 104 és 151 között változott. A vizsgált időszakban a fészkek (és költőpárok) számának változása növekvő trendet mutat, 1991-hez képest 2000-re a lakott fészkek száma 34,6%-al nőtt (1. ábra). Amennyiben a területen költő párok (HPa) számának megállapításakor figyelembe vesszük a magányos gólyák (HE) számát - ez JAKAB (1986) alapján 2-5%-nyi -, a költőpárok (Hpa) száma 99-102 (1991-ben) és 143-148 pár (1996-ban) között változott.

- A 2. ábra mutatja az eredményes költések (HPm) arányának változásait a vizsgált időszakban. A 10 éves ciklusban az eredményes költések aránya 1997-ben volt a legalacsonyabb (49,6%), s 1994-ben volt a legmagasabb (83,3%).

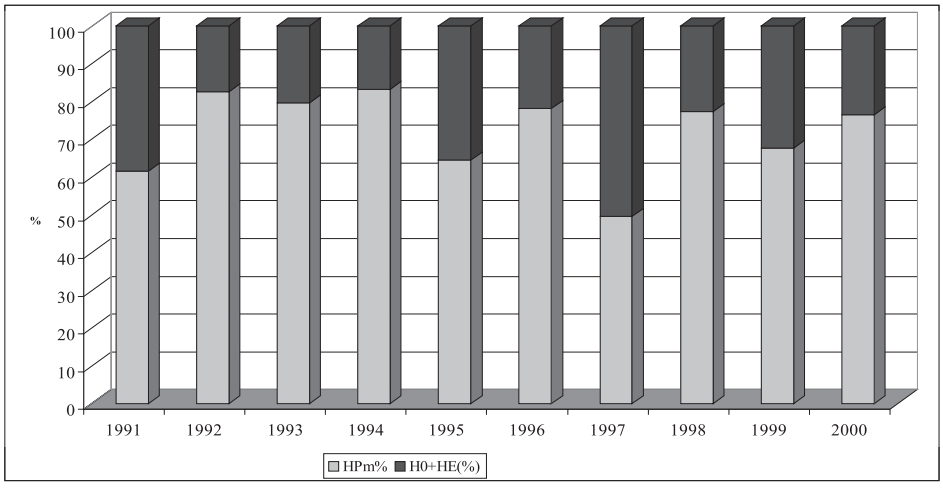
- A 3. ábra a fészkenkénti fiókaszám gyakoriságának változásait mutatja a vizsgált időszakban. Az ábrát tanulmányozva látható, hogy a legmagasabb értéket (közel 70%) a 2 fiókás fészkek aránya - a már említett 1997-es esztendőben - érte el.

- Az 4. ábrán az összes kirepült fióka számát (JZg) és az eredményes költésekre (HPm) vetített fiókaátlagot (JZm) tüntetjük fel. Adataink szerint a 10 év alatt 2330 fióka repült ki a vizsgált területen, mely 233 fióka/év átlagot jelent. Az 5. ábrán látható, hogy a JZG és JZm három legmagasabb értéke 1996, 1994 és 2000-ből származik.

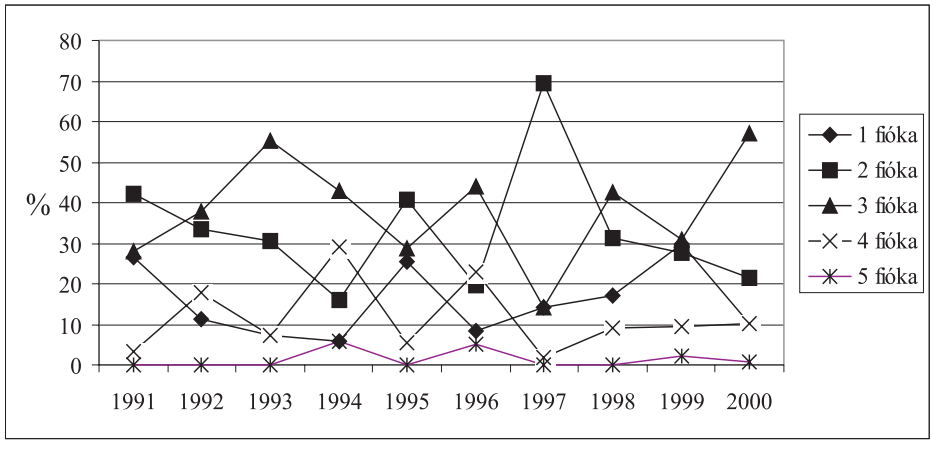
- A sűrűség (StD) értéke a vizsgált területen 8,25-12,33 pár/100 km^2 volt, mely Somogy-megye teljes területéhez (6,5-6,7 gólyapár/100 km^2), illetve hazánk területéhez (5,9 pár/ km^2) viszonyítva is jelentős állományt mutat.



1. ábra: A fészkek számának alakulása a vizsgált időszakban



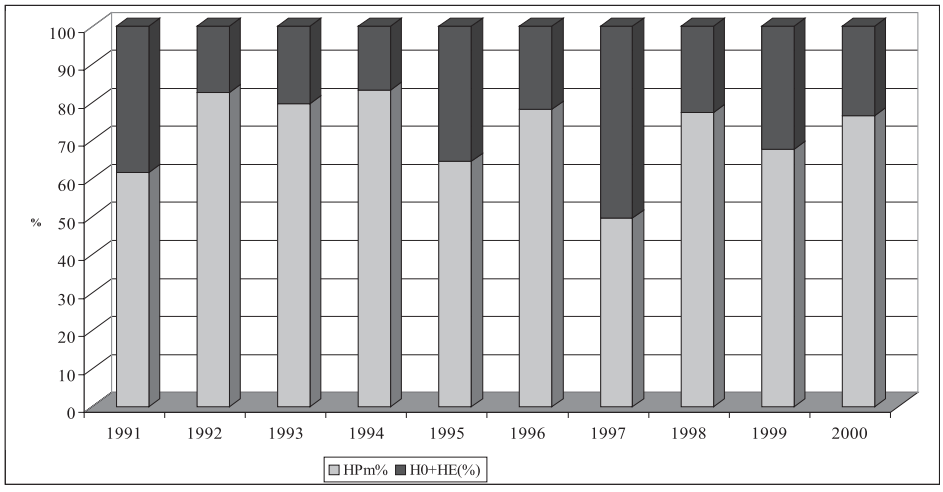
2. ábra: Az eredményes költések (HPm) arányának változása 1991-2000 között



3. ábra: A fészkenkénti fiókaszám gyakoriságának változásai

Köszönetnyilvánítás

A felmérésekben való közreműködésért fogadja köszönetem Csór Sándor, Horváth Zoltán, Mezei Ervin és Stix József. A munka támogatásáért a Magyar Madártani és Természetvédelmi Egyesületet, a Somogy Természetvédelmi Szervezetet és a Duna-Dráva Nemzeti Park Igazgatóságot illeti köszönet.



4. ábra: Az összes fiókaszám (JZG) és az eredményes költésekre vetített fiókaátlag (JZm) változásai a vizsgált időszakban

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DOI:10.24394/NatSom.2009.15.219 | Natura Somogyiensis | 15 | 219-226 | Kaposvár, 2008

A Somogy megyei fehér gólya (*Ciconia ciconia*) állomány 2004. évi felmérésének eredményei

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HORVÁTH, Z.: *Results of the white stork population survey in whole Somogy County in 2004.*
Abstract: The author presents the results of the survey of the white stork population in whole Somogy County. During the survey 410 nests were recorded and 325 were occupied. From the 251 succesful breedings 712 nestlings flied off. The survey points out that 151 nests on electric pylons have not been stilted yet.

Keywords: white storke, *Ciconia ciconia*, breeding pairs

Bevezetés

A fehér gólya szinte mindig az ember közelségében telepszik meg, fészkei ma elsősorban települések villanyoszlopain és épületek kéményein találhatóak. Mivel mindennapi élettevékenysége a vidéki ember számára folyamatosan nyomon követhető, így az egyik legismertebb madarunkká vált. Somogy megye a magas erdősültségű, kevés településsel rendelkező megyék közé tartozik. Az elmúlt századok külterjes állattartása következtében kialakult gyepterületek bőven biztosítottak élőhelyet a gólyák számára. Napjainkban a gyepterületek drasztikus csökkenése figyelhető meg, emiatt megyénkben már csak néhány település büszkélkedhet jelentősebb gólyaállománnyal. A gólyapárok alakulásának nyomon követéséhez folyamatos monitoring tevékenység szükséges. A 2004. év, az öt évente megszervezésre kerülő, az ország teljes területét lefedő „gólyacenzus'' éve volt, ezért e munka a Somogy megyei felmérés összegzését tűzte ki céllul.

A megye már jelentős területét érintő állományfelmérés 1956-ban Marián Miklós szervezésében történt, amikor mintegy 300 segítő bevonásával, 172 községből sikerült adatot gyűjteni (MARIÁN 1956). Marián szerint a „*megfigyelt 398 fészekből az idén 20 lakatlan. A fiókák számát 246 fészekben sikerült megállapítani. E fészkekben összesen 718 fióka nőtt fel és repült ki.*" Sajnos, e dolgozatban községekre vonatkozó adatok nincsenek. Az 1958, 1963 és 1968. évi felmérések eredményeit szintén MARIÁN (1971) összegzi. A tanulmányban 177 somogyi község szerepel, azonban egy-egy településnél gyakran hiányzik valamely felmérés eredménye. A dolgozat szerint 1958-ban 137 településen 490, 1963-ban 155 településen 455 és 1968-ban 127 településen 293 költőpár vált ismertté. Dél-Somogyban, egy 1100 km^2-es mintaterületen 1991 óta folyik rendszeres állományfelmérés, amelynek részeredményét FENYŐSI (1998) adta közre. E mintaterületen a vizsgálat ideje alatt folyamatosan emelkedett a költőpárok száma, a vizsgált 9 év alatt mintegy 20 %-al. 1992-ben a Somogy Természetvédelmi Szervezet kezdemé-

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

nyezésére történt újabb állományfelmérés, ekkor 153 településen 316 fészek került összeírásra. Sajnálatos, hogy az 1992-es felmérés eredményei ma már nem hozzáférhetők. Az 1992-es és az 1956-os felmérés néhány eredményének összevetését adja FENYŐSI (1994). Az újabb, 1994-es állományfelmérés során 170 településen 407 fészket sikerült ellenőrizni, melyből lakatlan 69, lakott 338 fészek volt (HUNYADI 1994). A Balaton vonzáskörzetében lévő észak-somogyi településeken végzett gólyafelmérések eredményeit NOVOTNY et. al. (1995) és LÁSZLÓ et. al. (1996) foglalta össze. E munkákban 51 település mintegy 100 fészkelőhelyének (cca. 65 pár) adatait közölték. Az 1999-ben végzett felmérések eredményeiről FENYŐSI és HORVÁTH (2000) alapján tudjuk, hogy a megye mintegy 80%-án történt számlálás alapján 421 fészek került elő, ebből 359 fészek volt foglalt, a 237 sikeres költésből pedig 586 fióka repült ki. Az Őrtilos és Barcs közötti 17 településen a „Dráva Monitoring program'' keretei közt 2000-2004-ben történt állományfelmérés, ennek eredményeit FENYŐSI (2005) közli. E szerint a 17 településen az öt év alatt közel 20%-al csökkent a költőpárok száma, 58-ról 45-re.

Anyag és módszer

A mintegy 6000 km^2 kiterjedésű Somogy megye hazánk legnagyobb kiterjedésű megyéi közé tartozik. Északon a Balaton, keleten a Külső-Somogyi-dombvidék, a Kapostól délre a Zselicség, nyugaton a Marcali-löszhát és a Csurgó-Zákányi-dombság, a megye középső és déli területein a Belső-Somogy homokvidéke terül el. A Külső-Somogyi-dombvidék tengerszint feletti magassága 130-300 m közötti (max. 312 m), évi csapadékösszege északon 600, délen 650-700 mm. Éghajlatára a kontinentális jelleg, illetve szubmediterrán hatás is jellemző. A terület erdősültsége a megyében itt a legalacsonyabb, az erdőségek (cseresek, gyertyános-tölgyesek, kultúrerdők) mellett szántók, gyümölcsösök, szőlők is meghatározók. A Zselicség a megye legerdősültebb területe (cca. 30 % erdő), tengerszint feletti magassága 140-300 m, az évi csapadékösszege: 710 mm. A Marcali-löszhát Belső-Somogy homokvidékéből szinte szigetszerűen emelkedik ki. A lösszel borított dombvonulat meglehetősen száraz. A Csurgó-Zákányi-dombság tengerszint feletti magassága 150-280 m, csapadékos (750 mm) és szubmediterrán hatásokat mutató éghajlattal, illetve magas erdősültséggel jellemezhető. Belső-Somogy a megye legnagyobb kiterjedésű középtája. A tengerszint feletti magassága 107-193 m közötti, évi csapadékösszege: 700-800 mm. Az enyhén hullámos felszínű homokvidéken észak-déli irányú buckavonulatok, s ezek között lefolyástalan láptavak a jellemzők. Az egykori láptavakból és vízfolyásokból számtalan halastavat alakítottak ki. A gólyák elsődleges költőhelye - kevés kivételtől eltekintve - Somogy megyében is a településeken található. Legfontosabb táplálkozóhelyeik: a kaszálórétek, a nedves mocsárrétek (a Dráva mentén), az egyre csökkenő területtel, de még szinte minden községhatárban megtalálható fáslegelők és kaszálók. Előző területek mellett fontos táplálkozóhelyek a tavak, a patakok, a csatornák és a láptavak környéke, illetve szántók és egyéb kultúrterületek is biztosíthatnak táplálékot a faj számára.

2004-ben a megye teljes területén a felmérők területi lehatárolású térképek segítségével végezték el a felmérést. A munka során - régebbi adatsorokra is támaszkodva - július első hetében felkeresték a településeken található fészkeket, s rögzítették a korábbi felmérések során is használt adatokat (fészek helye, tartóaljzat, lakottság, fiókaszám, stb).

Eredmények

A 2004. évi felmérés során a vizsgált 269 település közül 176-ban került elő gólyafészek, a megye településeinek 63,9 %-ában. 172 településen foglalt fészket gólyapár, 4 településen csak magányos gólyát figyeltünk meg (1. táblázat). A 410 fészek közül 85 lakatlan, 325 lakott fészek volt. A 325 fészekből 251-ben láttunk fiókát, 69-ben nem volt fióka, illetve 5 fészket magányos gólya használt (2. táblázat). A 251 db fiókás fészekben 1-5 fiókát láttunk, amelynek eredményeként minimálisan 712 fióka repült ki a vizsgált területen (3. táblázat). Az átlagos fiókaszám alakulása fiókás fészkekre vetítve 2,84 fióka/fészek, a foglalt fészkekre vetítve 2,19 fióka/fészek volt. A megye területén 151 db villanyoszlopon lévő fészek nincs magasítva. Az 54 db üres magasító bizonyítja, hogy műfészek illetve gallyak nélkül a gólya kevésbé foglalja el a magasítókat. A sűrűség alakulása a megye területén 5,42 gólyapár/100 km^2. A 4. táblázatban szerepelnek az eddigi felmérések eredményei, melyek közül az 1994 és a 2004 évek tekinthetők teljes mértékűnek. A településenként összesített gólyapárok számát az 5. táblázat tartalmazza, amelyből megállapítható, hogy 10 pár feletti költőállomány már csak két településen található (Berzence és Nagybajom).

1. táblázat: A felmérés során vizsgált települések megoszlása, az előkerült gólyafészkek alapján

	települések száma	%
Települések száma, ahol nem találtunk fészkek	77	28.6
Települések száma, ahol csak üres magasító található	16	6.0
Települések száma, ahol csak magányos gólya foglalt fészket	4	1.5
Települések száma, ahol gólya pár foglalt fészket	172	63.9
Összes település	**269**	**100**

2. táblázat: A fészkek száma a vizsgált területen

Lakatlan:	85 fészek
Lakott	
- Nincs fióka (HO)	69 fészek
- Magányos gólya (HE)	5 fészek
- Fészek fiókával/fiókákkal (HPM)	251 fészek
Lakott összesen:	**325 fészek**
Mindösszesen:	**410 fészek**

Köszönetnyilvánítás

A felmérésben végzett munkájáért hálás köszönetemet fejezem ki Bende Zsolt, Csór Sándor, Glatz Róbert, Mezei Ervin, Pintér András, Rozner György, Szegvári Zoltán és Tanai Károly kollégáimnak, barátaimnak. Továbbá, az adatfeldolgozás során nyújtott segítségéért köszönet illeti Schulcz Andreát. A felmérő munkát a Magyar Madártani és Természetvédelmi Egyesület, a Somogy Természetvédelmi Szervezet és a Duna-Dráva Nemzeti Park Igazgatóság támogatta.

3. táblázat: A fiókaszám megoszlása a vizsgált területen

	eset	fióka szám (JZG)
1 fiókás fészek	18	18
2 fiókás fészek	60	120
3 fiókás fészek	121	363
4 fiókás fészek	49	196
5 fiókás fészek	3	15
Összesen	**251**	**712**

4. táblázat: Somogy megyei gólyafelmérések eredményei

Évszám	Települések száma, ahol gólyafészek található	Lakatlan fészkek száma	Lakott fészkek száma (HPa+HE)	Összes fészek száma
1958	137	?	490	490 (?)
1963	155	?	455	455 (?)
1968	127	16	293	309
1994	172	69	338	407
1999	166	62	359	421
2004	176	85	325	410

5. táblázat: A gólyapárok költési eredményeinek összesítése településenként 2004-ben

Sorszám	Település	Fészek-szám	Költő-pár	Fióka-szám
1.	Ádánd	2	2	7
2.	Babócsa	4	3	4
3.	Bakháza	2	2	4
4.	Balatonberény	1	0	0
5.	Balatonfenyves	2	2	8
6.	Balatonkeresztúr	1	1	0
7.	Balatonkiliti	1	1	4
8.	Balatonöszöd	1	1	2
9.	Balatonszabadi	3	3	10
10.	Balatonszentgyörgy	1	1	4
11.	Balatonújlak	1	1	3
12.	Barcs	8	5	8
13.	Baté	1	1	5
14.	Bélavár	1	1	2
15.	Beleg	3	2	4
16.	Berzence	18	17	41
17.	Bodrog	2	0	0
18.	Bolhás	1	1	3
19.	Bolhó	2	1	2
20.	Böhönye	1	1	3
21.	Böhönye-Lászlómajor	2	1	3
22.	Bőszénfa	1	1	0

5. táblázat folytatása

Sorszám	Település	Fészek-szám	Költő-pár	Fióka-szám
23.	Buzsák	3	3	9
24.	Csákány	1	1	3
25.	Csokonyavisonta	10	9	16
26.	Csombárd	1	1	3
27.	Csököly	5	5	14
28.	Csömend	1	1	2
29.	Csurgó	4	2	4
30.	Darány	4	4	9
31.	Drávagárdony	1	1	4
32.	Drávaszentes	4	3	10
33.	Drávatamási	1	1	1
34.	Edde	1	1	3
35.	Felsőbogátpuszta	1	1	2
36.	Fonyód	1	1	3
37.	Főnyed	1	1	3
38.	Gálosfa	1	1	3
39.	Gige	1	1	3
40.	Gölle	3	2	3
41.	Görgeteg	5	5	7
42.	Gyékényes	1	1	0
43.	Hács	1	1	4
44.	Háromfa	5	4	12
45.	Hedrehely	2	2	5
46.	Hencse	1	1	0
47.	Heresznye	1	1	0
48.	Hetes	2	2	7
49.	Homokszentgyörgy	4	3	4
50.	Hosszúvíz	1	0	0
51.	Igal	1	1	0
52.	Iharos	2	2	0
53.	Iharosberény	2	1	3
54.	Inámpuszta	3	2	3
55.	Inke	7	6	3
56.	Istvándi	1	0	0
57.	Jákó	6	6	7
58.	Juta	1	1	4
59.	Kadarkút	3	3	7
60.	Kálmáncsa	4	2	4
61.	Kapoly	1	1	3
62.	Kaposfő	2	2	5
63.	Kaposmérő	2	2	6

5. táblázat folytatása

Sorszám	Település	Fészek-szám	Költő-pár	Fióka-szám
64.	Kaposszerdahely	1	1	4
65.	Kaposvár	5	3	11
66.	Kaposvár-füred	1	1	3
67.	Karád	1	1	3
68.	Kastélyosdombó	1	1	3
69.	Kazsok	1	1	3
70.	Kelevíz	1	1	0
71.	Kéthely	4	3	10
72.	Kisbajom	2	1	4
73.	Kisgyalán	1	1	0
74.	Kiskorpád	2	1	2
75.	Kivadár	1	0	0
76.	Komlósd	1	1	3
77.	Kőröshegy	2	2	5
78.	Kutas	3	2	5
79.	Kürtöspuszta	1	0	0
80.	Lábod	5	5	17
81.	Lad	1	1	4
82.	Lakócsa	7	7	11
83.	Látrány	1	1	3
84.	Lengyeltóti	3	2	6
85.	Libickozma	1	0	0
86.	Lulla	2	1	3
87.	Magyaregres	1	1	3
88.	Marcali	3	2	6
89.	Marcali-Bize	1	1	2
90.	Marcali-Boronka	3	1	2
91.	Marcali-Gyótapuszta	1	1	3
92.	Mernye	1	1	0
93.	Mernyeszentmiklós	1	1	0
94.	Mesztegnyő	8	3	9
95.	Mezőcsokonya	2	1	3
96.	Mike	2	1	3
97.	Mosdós	2	2	3
98.	Nadalos	1	0	0
99.	Nagyatád	4	3	7
100.	Nagybajom	18	14	36
101.	Nagyberki	3	2	3
102.	Nagycsepely	1	1	0
103.	Nagykorpád	3	3	7
104.	Nagyszakácsi	3	3	2

5. táblázat folytatása

Sorszám	Település	Fészek-szám	Költő-pár	Fióka-szám
105.	Nemesdéd	1	1	2
106.	Nemesvid	4	4	5
107.	Nemesvid-Kisvid	4	4	0
108.	Nikla	4	4	13
109.	Nyim	1	1	2
110.	Orci	1	1	5
111.	Ordacsehi	2	2	0
112.	Osztopán	1	1	3
113.	Öreglak	1	1	3
114.	Ötvöskónyi	5	4	13
115.	Patca	1	0	0
116.	Patosfa	1	1	3
117.	Péterhida	1	1	2
118.	Porrog	2	0	0
119.	Porrogszentkirály	3	2	0
120.	Potony	6	6	13
121.	Pusztakovácsi	3	2	7
122.	Ráksi	1	0	0
123.	Rinyakovácsi	2	1	3
124.	Rinyaszentkirály	3	3	9
125.	Rinyaújlak	1	1	2
126.	Rinyaújnép	1	1	3
127.	Somogycsicsó	2	1	0
128.	Somogyudvarhely	2	2	2
129.	Ságvár	2	2	3
130.	Sántos	1	1	3
131.	Sávoly	3	3	5
132.	Segesd	3	2	3
133.	Siójut	1	1	1
134.	Som	2	0	0
135.	Somogyaszaló	1	0	0
136.	Somogyfajsz	2	1	2
137.	Somogyjád	1	0	0
138.	Somogymegyes	1	1	2
139.	Somogysámson	1	1	2
140.	Somogysárd	1	1	3
141.	Somogysimonyi	1	1	2
142.	Somogyszentpál	5	4	8
143.	Somogyszil	1	1	3
144.	Somogyszob	2	2	3
145.	Somogytarnóca	1	0	0

5. táblázat folytatása

Sorszám	Település	Fészek-szám	Költő-pár	Fióka-szám
146.	Somogyvár	1	1	1
147.	Somogyzsitfa	7	5	10
148.	Szabadi-Csoma	2	2	1
149.	Szabás	2	2	6
150.	Szenta	2	1	3
151.	Szentbalázs	1	1	4
152.	Szentborbás	1	1	2
153.	Szentgáloskér	1	1	3
154.	Szőcsénypuszta	2	2	4
155.	Szökedencs	2	1	3
156.	Szőlősgyörök	1	1	4
157.	Szulok	2	2	8
158.	Tapsony	1	0	0
159.	Tarany	2	2	8
160.	Táska	3	2	5
161.	Taszár	1	1	3
162.	Tikos	1	1	3
163.	Tótújfalu	2	2	5
164.	Újvárfalva	1	0	0
165.	Várda	2	1	2
166.	Vése	3	2	2
167.	Vízvár	3	3	9
168.	Vörs	4	3	5
169.	Zákány	1	1	3
170.	Zala	1	1	1
171.	Zselickisfalud	4	1	2
172.	Zselickislak	1	1	0

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DOI:10.24394/NatSom.2009.15.227 | Natura Somogyiensis | 15 | 227-230 | Kaposvár, 2009

Data for external morphometry of stone marten, polecat and weasel in Hungary

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Lanszki, J. & Valkár, B: *Data for external morphometry of stone marten, polecat and weasel in Hungary.*
Abstract: External morphologic parameters of the stone marten (*Martes foina*), polecat (*Mustela putorius*) and weasel (*Mustela nivalis*) were examined by means of carcasses (n=93, 34 and 12, respectively) collected between 1984 and 2009. The adult males were significantly bigger than the females, in body weight (BW) and all studied measurements, such as body length (BL), tail length (TL), hind foot length and ear length. Mean BW of adult stone martens was 1703 g and 1309 g, BL 450 mm and 419 mm, TL 255 mm and 241 mm in males and females, respectively. Mean BW of adult polecats was 1363 g and 728 g, BL 410 mm and 358 mm, TL 158 mm and 143 mm in males and females, respectively. Mean BW of adult male weasels was 146 g, BL 213 mm, and TL 69 mm.

Keywords: *Martes foina, Mustela putorius*, *Mustela nivalis* Hungary

Introduction

The stone marten (*Martes foina*), the polecat (*Mustela putorius*) and the weasel (*M. nivalis*) are common carnivores in Hungary (Heltai and Lanszki 2007a, 2007b, Tóth et al. 2007). Despite wide geographical distribution of these mustelids, knowledge about the biometry, biology and demography is still scarce in Hungary. Overview works (eg. Faragó 2002) or The Atlas of Hungarian Mammals (eds. Bihari et al. 2007) give series of external measurements concerning biometry, mainly from other countries. The aim of this study was to summarize suppletory external morphologic parameters from the Hungarian population of the three mustelids.

Material and methods

Morphologic parameters of road traffic killed and trapped stone martens (n=93), polecats (n=34) and weasels (n=12) were examined by means of carcasses collected between 1984 and 2009. The seasonal distribution of stone marten carcasses collected was the following, winter: 33, spring: 15, summer: 15, autumn: 20 and unknown: 10. The stone marten bodies originated from Nógrád county: 51, Borsod-Abaúj-Zemplén county: 16, Somogy and Baranya counties: 20, and western Transdanubian region: 6. The seasonal

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

distribution of polecat carcasses collected was the following, winter: 7, spring and summer: 10 and autumn: 17. The polecat bodies originated from: Nógrád county: 17, Borsod-Abaúj-Zemplén county: 13, and Transdanubian region: 4. The weasel carcasses origined from all seasons; south Transdanubian region: 9, western Transdanubian region: 2 and Borsod county: 1.

In the post mortem examination general data (location, date, cause of death), sex, body weight (BW, to the nearest 0.1 or 1 g for weasel and 5 or 10 g for marten and polecat), body length (BL, length from nose to anus), tail length (TL, from anus to tail tip, excluding terminal hairs), hind foot length (FL), ear length (EL) were recorded. The examined bodies were categorised into adult and juvenile age groups according to body weight, measurements and teeth characters. A part of the bodies was so damaged after the road accident that it was not possible to measure all dimensions, therefore different sample sizes can be found in some traits in Table 1.

Results and discussion

The mean body weight (BW), body length (BL), tail length (TL), hind foot length (FL) and ear length (EL) data of the stone marten are summarized in Table 1. Sexual dimorphism was marked: males were bigger and heavier than females (independent samples t-tests, $P<0.001$ in all parameters). In juvenile age group of stone marten the mean (±SE) BW in males (n=16) and females (n=5) was 1311±39.3 g and 899±33.6 g, BL 436±6.2 mm and 382±14.8 mm, TL 238±4.3 mm and 197±19.7 mm, respectively. Adults were slightly heavier than those stone martens which were studied in Germany (males: 1619.3g, females: 1233.2 g; Stubbe 1993), data in other parameters were similar.

The body weight and external morphologic data of the polecat are summarized on Table 1. Adult males were heavier and longer than females (independent samples t-tests,

Table 1: External morphologic parameters of adult stone martens (Martes foina), polecats (Mustela putorius) and weasels (Mustela nivalis) in Hungary

Parameter	Stone marten		Polecat		Weasel	
		Males	Females	Males	Females	Males
BW (g)	Mean±SE	1703±31.8	1309±25.9	1363±49.0	728±34.2	145.7±13.16
	Min.-max.	1410-2310	1010-1510	1120-1800	600-890	112-220
	n	41	30	15	8	8
BL (mm)	Mean±SE	450±2.8	419±25.9	410±4.4	358±8.5	212.9±5.87
	Min.-max.	430-509	353-456	380-440	310-390	194-239
	n	39	30	15	8	8
TL (mm)	Mean±SE	255±2.5	241±3.6	158±3.5	143±5.9	68.9±2.34
	Min.-max.	218-300	212-280	130-190	120-170	61-83
	n	39	29	16	8	8
FL (mm)	Mean±SE	90±0.7	82±2.9	64±1.7	57±2.4	32.8±1.29
	Min.-	85-95	73-90	55-70	52-60	28-39
	n	20	9	9	3	8
EL (mm)	Mean±SE	33±0.6	30±1.7	20±1.2	16±1.4	-
	Min.-	28-40	23-35	16-27	13-20	-
	n	24	22	10	5	-

Notes: BW: body weight, BL: body length, TL: tail length, FL: hind foot length, EL: ear length, n: number of individuals measured.

P<0.05 0.001), except of hind foot length (P=0.063). In juvenile age group of polecat the mean BW in males (n=5) and females (n=5) was 769±90.6 g and 585±38.7 g, BL 370±19.2 mm and 341±6.7 mm, TL 152±12.1 mm and 134±5.2 mm, respectively. Adult polecats were slightly heavier than those which measured in a Czech-Slovakian study (males: 1131.0 g, females 653.9 g; Wolsan 1993), BL was slightly shorter, but in other parameters data were similar.

Appraisable sample number of weasel was available only from males (Table 1). BW of the two studied females was 36 g, and 42 g, BL of bigger female was 153 mm, TL: 43 mm and FL: 14 mm. BW of two juvenile females was 31.7 and 33.5 g, BL: 149 and 150 mm, TL: 41 and 40 mm. Adults were slightly heavier than weasels studied in Germany (males: 67.7 g, females: 39.6 g; Reichstein 1993). Other parameters were also larger, but similar to the study of Széky (1972) performed in Hungary (males: 214 mm, females: 176 mm).

More males than females were studied, the sex ratio (male : female) both for the stone marten and polecat was also 62:38%. Most of studied animals were adult, the ratio between adult and juvenile age groups was 77:23% for the stone marten and 71:29% for the polecat.

In conclusion, suppletory, new results arisen from this study are utilizable in management programs of carnivores.

Acknowledgements

Thanks for the help in collection of animal carcasses.

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DOI:10.24394/NatSom.2009.15.231 | Natura Somogyiensis | 15 | 231-246 | Kaposvár, 2009

Feeding habits of the stone marten (*Martes foina*) in villages and farms in Hungary

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Lanszki, J., Sárdi, B., & Széles, L. G.: *Feeding habits of the stone marten (Martes foina) in villages and farms in Hungary.*

Abstract: Habitat type dependent feeding habits of the stone marten (*Martes foina*) was examined in eight villages and four farms of Somogy county on the basis of scat analysis (n=1227). In the studied summer-autumn period plants (mainly pear, plum, cherry/sour-cherry, grape) formed the dominant component of the diet (villages: 35.6-87.4%, farms 54.1-91.3%). Relying on the animal food, in villages primarily birds (42%, mainly with small singing-birds), secondly small mammals (33%), while on farms primarily small mammals (46%, mostly voles), secondly birds (27%) were consumed, but the difference depending on the type of habitat was not significant. Martens in villages compared with the ones which live on farms consumed more prey species living on trees and bushes (43% vs. 27%) and less terrestrial preys (56% vs. 72%, $P<0.05$). Irrespectively of type of habitat, small prey species, 15-50 g in range of weight primarily (60%, vs. 50%), mainly habitat-generalist prey species, namely also living in open and forest habitat (84% vs. 87%), and prey species living in human habitat (40% vs. 47%), or also existing in wild and human habitat, were consumed. Consumption ratio of domestic animals (poultry and egg, 7-48%), and rodent pests (house mouse and brown rat, 7-29%) were considerable.

Keywords: terrestrial prey, poultry, rodent pest, predator management

Introduction

Occurrence and colonization of numerous human culture follower animal species in settlements were noticed (Szemethy et al. 2000). In continental Europe, stone marten (*Martes foina*) is a common occupant of urban areas. Nowadays, it can be found not only in natural or nearly-natural areas but also from villages to cities, in different human settlements. According to surveys (Heltai 2002), it was found in 80% of Hungary. As for hiding-place, mainly neglected, ruined buildings, ports, lofts are chosen, but church-lofts are also often used. Reasons behind urbanization are also the decrease of natural habitats, safe and secure hiding-places and food given by built up areas (Powell 1994, Adams et al. 2005, Tóth et al. 2007). The presence of wildlife in settlements is usually welcomed, it sometimes also results in more or less severe conflict situations, which may reduce tolerance of the animals in questions. It could have filled a part of management of substance of economic damage causing rodent pests (e.g. house mouse, rat), which also has public sanitation and economical consequences. In close contact of man, stone marten could be a vector of certain zoonoses, furthermore in declining of the barn-owl (*Tyto alba*) populations (Tóth et al. 2007). Conflicts between humans and martens arise

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

when the animals den under the roofs of inhabited buildings or damage in poultry stock or car engine components (HERR et al. 2009b, in Hungary: LANSZKINÉ and LANSZKI 2005, HELTAI and SZŐCS 2007). From 1st September to 28th February marten is a fair game in Hungary, its bag shows permanent growing. In the hunting season of 2007/2008 1058 individuals were shot by hunters (CSÁNYI 2008).

The marten "question" is a new discipline and it could be involved in urban wildlife management. Finding a definition for 'urban' is not straightforward and the meaning often depends on the context in which the term is used. Generally, social scientists use urban to refer to areas with high human densities, while ecologists use the term more widely to refer to areas under human influence (MCINTYRE et al. 2000). In the United States, urban wildlife management has already been handled for a long time (e.g. SOUTHWOOD and HENDERSON 2000, ADAMS and LINDSEY 2005), and it has also been the item on the agenda in Europe (e.g. HERR et al. 2009a, 2009b). Managing urban habitats of wild species, possibly their increase, reduction and prevention of caused damages together with constitutioning of legislative regulation are the main sections of it (MCIVOR and CONOVER 1994, DECKER and CHASE 1997, HELTAI and SZŐCS 2007).

Marten is an omnivorous feeder (WAECHTER 1975); feeding habits examinations show that within choice of food it shows generalist and opportunist features. It can also be the reason behind its successful spread. The marten is mostly terrestrial, but it also hunts and moves easily in the foliage level (arboreal). Seasonally and depending on habitat its diet is also shown high variability, which were also analyzed by numerous studies, such as in urban environments (HOLISOVÁ and OBRTEL 1982, TESTER 1986, RASMUSSEN and MADSEN 1985), rural environments, such as villages, farms and outside buildings (RASMUSSEN and MADSEN 1985, ROMANOWSKI 1991, LODÉ 1994), highland, forest and rocky areas (MARTINOLI and PREATONI 1995, GENOVESI et al. 1996, PADIAL et al. 2002, PRIGIONI et al. 2008), and wetlands (LODÉ 1994). In Hungary, feeding habits of the stone marten were investigated in Aggteleki Baradla cavern (SALAMON 1981), Tibolddaróc, village in the Bükk-mountains (LANSZKI 1992), Budapest, green district (TÓTH 1998), Fonó, village and its surrounding agricultural environment in Somogy county (LANSZKI et al. 1999, LANSZKI 2003), Látrány, grassland, Somogy county (LANSZKI and NAGY 2003), Gödöllő, by human disturbed environment (HELTAI et al. 2005), Pettend, village and agricultural environment in the Ormánság region (LANSZKI and SZÉLES 2007). However, the marten has been widely distributed and common in Hungary, the habits of those which live in rural areas are relatively less known.

The aim of this study was to examine the habitat type dependent feeding habits of the stone marten which exists in villages and farms, including weight of preys, habitat levels, examination by its connection to habitat type and human resources, and collecting of feeding-biology knowledge for the urban wildlife management. In our study we focused on the summer and early autumn reproduction period, when adults are "noisy", young martens have already been able to hunt, and tenants noticed their presence.

Material and methods

Study areas

The study was performed in the centre and northern part of Somogy county in eight villages and four outside farms (Figure 1) in September and October of 2006, once per localities, parallel with the collection of barn-owl pellets. Study locations (and sample sizes) in villages: Somogysimonyi, Catholic church (n=75 marten scats), Nemesvid,

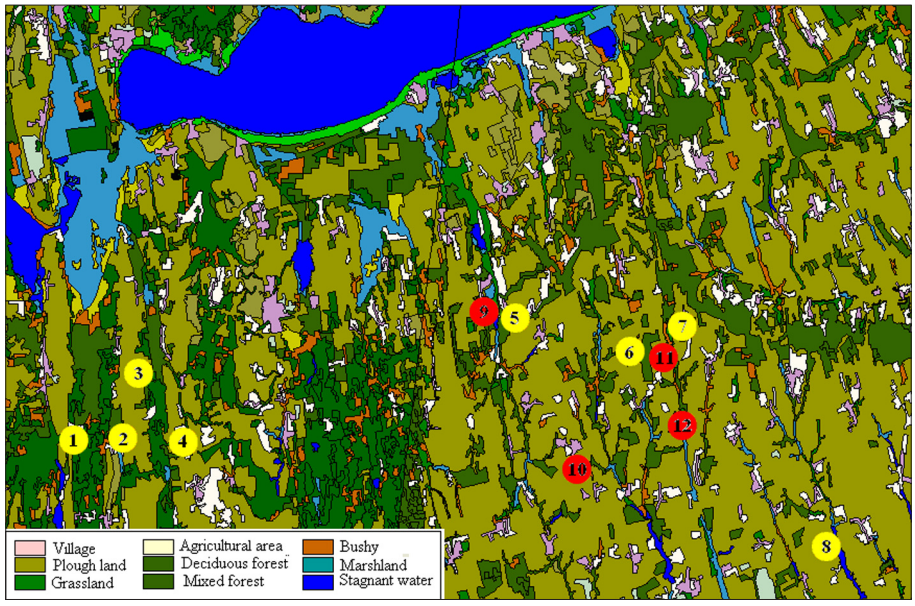

Fig. 1: Geographic location of the stone marten samples collected in villages (yellow circles) and farms (red circles) in Somogy county (Hungary).
Locations: 1 – Somogysimonyi, 2 – Nemesvid, 3 – Csákány, 4 – Nagyszakácsi, 5 – Somogyvár, 6 – Polány, 7 – Felsőmocsolád, 8 – Kisgyalán, 9 – Somogyvár, 10 – Somogyjád, 11 – Mernyeszentmiklós and 12 – Mernye**.**

Catholic church (n=145), Csákány, Catholic church (n=80), Nagyszakácsi, Catholic church (n=84), Somogyvár, Catholic church (n=106), Polány, Lutheran church (n=101), Felsőmocsolád, granary (n=80) and Kisgyalán, granary (n=203). These villages have orchards with various fruit trees and domestic animals – especially poultry – kept in house yards. Study locations in outside farms: Somogyvár, stock-yard and granary (n=104), Somogyjád-Magyaróvölgy, stock-yard (n=111), Mernyeszentmiklós, granary (n=82) and Mernye, granary (n=52). The distribution of the different habitat types around farms was as follows (mean): plough land 72,6%, building and garden 8.4%, grassland 4.2%, forest 8.2% and wetland 6.6%.

To study the possible interaction between the stone marten and the barn owl, sample collection was also performed on further eight localities, such as Andormajor, granary (n=12), Mesztegnyő, Catholic church (n=0), Buzsák, Catholic church (n=0), Buzsák, stock-yard (n=10), Öreglak, chapel (n=36), Ecseny, Evangelic church (n=0), Felsőmocsolád, Catholic church (n=0), Gamás (n=33). The sample size was under 50 in these localities, therefore no diet analysis was made. Owl pellet numbers origined from J.J. Purger (PURGER 2008 and PURGER J.J. pers. data).

Sample collection and analysis

The feeding habits of stone martens were investigated by analysis of scats, using standard procedure (JEDRZEJEWSKA and JEDRZEJEWSKI 1998). Prey determination was performed by microscope on the basis of feather, bone, dentition and hair characteristics (e.g. MÄRZ 1972, UJHELYI 1989, TEERINK 1991, BROWN et al. 1993, and own collections).

For the quantitative (percentage biomass or %B) estimation the scats were washed through filters (0.5 mm pore diameter) and dried, after which the remains of each items were separated. All dry prey or plant remains were weighed and multiplied by coefficients of digestibility described by JEDRZEJEWSKA and JEDRZEJEWSKI (1998) for the marten, such as small rodents, insectivores, bats and weasel ×23, medium-sized mammals, e.g. brown hare ×50, cervid carcasses ×15, domestic ungulate carcasses ×118, birds ×35, reptiles and amphibians ×18, fish ×25, insects ×5, and plants ×14. In the rare case of dog or cat food, factor of birds was used.

Plant and animal food was evaluated separately because the plant material was unlimited food source for martens in the study localities and period. Distribution of prey body weight was determined in accordance with CLEVENGER (1993), to create categories such as <15 g, 15-50 g, 51-100 g, 101-300 g and >300 g. Classification of prey on the basis of zonation (characteristic level of occurrence or the physical stratification where a species is most active) was made according to published data from GITTLEMAN (1985) on predators, 1 – terrestrial and terrestrial but sometimes arboreal, 2 – arboreal and arboreal but sometimes terrestrial, and 3 – aquatic or water-linked. Prey species were classified on the basis of their typical environment associations such as 1 – open field species, 2 – forest species or species living in dense shrubby, and 3 – mixed or habitat generalist species which may live both in open field and in forest. Prey species were classified on the basis of their human associations (LANSZKI 2003), 1 – wild, 2 – human-linked, and 3 – mixed. List and category of each animal food species contains Appendix 1.

Statistical analysis

The main animal food categories used in the trophic niche and environment dependent calculations were 1 – small mammals, 2 – domestic animals and house-food (plain cooking and pet food), 3 – birds, 4 – other vertebrates (reptiles, amphibians and fish) and 5 – invertebrates (arthropods and molluscs). Non-food (originally indigestible) substances ingested and hair fibres swallowed by the stone martens while grooming were not included in the calculation.

Trophic niche breadth (B) was calculated in accordance with Levins' index (KREBS 1989): $B= 1/\Sigma p_i^2$, where p_i = the relative biomass consumed of the ith taxon; and standardized across food taxa: $B_A =(B-1)/(n-1)$, rating from 0 to 1.

Diet composition depending on the habitat types was expressed in two ways (Table 1): number of occurrences in each food categories (N), and percentage of biomass consumed (%B). The consumption of main food taxa on the basis of the estimated percentage biomass values was compared with the two habitat types using independent samples t-test. The Chi-square (χ^2) test was applied for distribution analysis for the diet composition; prey consumption on the basis of weight, zonation and environmental associations of prey of the martens living in the two environments (village and farm). The Chi-square (χ^2) test was also applied for distribution analysis of marten scat and owl pellet numbers in each localities, furthermore for distribution analysis for the non-food item in the two habitat types. Small pebbles which probably originated from gizzard of birds were excluded from this calculation. Hierarchical cluster analysis was used to compare data of diet composition (%B) recorded for different study locations. SPSS 10 (1999) statistics program was used for processing data.

Table 1: Plant diet composition of stone martens living in villages and farms in Hungary

Food taxa	Village																							
	Farm																							
	1		2		3		4		5		6		7		8		9		10		11		12	
	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B
Grape	20	25.6	46	17.6	5	8.8	8	8.8	3	0.9	13	11.3	35	18.1	38	4.0	6	0.4	14	7.7	6	7.3	1	0.2
Cherry, soure cherry	3	4.7	11	18.8	9	57.3	15	42.2	5	8.1	7	19.4	25	31.8	71	33.8	5	4.9	17	16.0	9	14.7	6	10.3
Plum	12	33.4	10	12.6	2	5.0	2	3.9	43	68.2	8	26.7	17	24.5	89	49.3	64	82.0	37	53.9	7	15.4	36	74.1
Pear	3	0.8	16	19.2	4	3.2	1	0.6	7	6.2	26	27.4	7	3.4	8	0.6	9	8.3	3	2.4	3	4.4	6	11.1
Other fruits	25	32.7	44	20.7	22	19.2	48	27.1	21	14.2	17	12.0	34	20.8	64	10.1	13	3.5	28	13.9	20	27.3	10	4.0
Seeds	7	1.7	18	9.6	12	3.9	9	4.6	10	1.7	8	3.1	11	1.0	102	2.0	4	0.8	19	4.5	41	30.4	2	+
Other plant material	8	1.1	22	1.4	17	2.6	16	12.8	3	0.7	5	0.2	9	0.3	15	0.3	1	0.1	4	1.6	11	0.7	6	0.2
Sample size (n)	75		145		80		84		84		101		106		203		104		111		82		52	
Plant consumption[1]		60.2		47.3		44.7		44.6		87.4		64.4		71.2		77.6		84.3		67.3		54.1		91.3

Locations: 1 – Somogysimonyi, 2 – Nemesvid, 3 – Csákány, 4 – Nagyszakácsi, 5 – Somogyvár, 6 – Polány, 7 – Felsőmocsolád, 8 – Kisgyalán, 9 – Somogyvár, 10 – Somogyjád, 11 – Mernyeszentmiklós and 12 – Mernye. N – number of food elements, %B – biomass consumed, + – less than 0.05%, [1]within the overall food. Empty cells mean that the given taxon was not detected.

Results

Diet composition and trophic niche breadth of martens

Plant material – especially fruits – formed the dominant component of the diet of stone martens in the studied summer-autumn period (mean, villages: 62.2%, farms 74.2%, Table 1). Of the fruits available, depending on the locality, pear, plum, cherry or sour-cherry, grape or berry were consumed in the largest proportions. The composition of plant or animal food of stone martens living in villages and farms did not differ significantly (t_{10}=1.22, P=0.255).

Primary animal food type of martens living in villages (Table 2) was birds (42.1±4.70%, mean±SE), but besides this, proportion of small mammals consumed was also considerable (32.5±3.90%). Primary animal food in farm environment consisted of small mammals (45.7±5.14%) and secondary foods were birds (27.0±6.00%). Between habitat types the distribution of taxonomically different food items was statistically significant (χ^2_4=23.23, P<0.001), but consumption (%B) of each food categories depending on habitat types did not differ significantly (t_{10}=0.41-2.00, P=0.073-0.693)

On the basis of hierarchical cluster analysis (Fig. 2), three groups were separated. Those locations (from top to bottom on the dendogram) where bird consumption was high (min.-max. 47.3-67.2%) fell into one group, those where consumption of small mammals was in high ratios (35.7-57.0%) into the second one, and those where consumption of domestic food was considerable (37.8% and 47.9%) fell into the third group.

The samples of the martens contained summarized 91 different food taxa (Table 2, Appendix 1): 12 small mammals, 1 ungulate, 7 domestic animals (+ pet food), 4 birds, 2 reptiles, 1 amphibian, 3 fish, 33 invertebrates, 13 fruit, 11 seed taxa and 3 other plant material. Trophic niche for the diet composition (%B) of the martens living in villages and farm environments was relatively narrow (B_A, 0.25±0.019 and 0.23±0.027, respectively), and between the two habitat types did not differ significantly (t_{10}=0.55, P=0.597). Highest value was measured in Somogysimonyi (B_A=0.32) and the lowest one in Nagyszakácsi (B_A = 0.14).

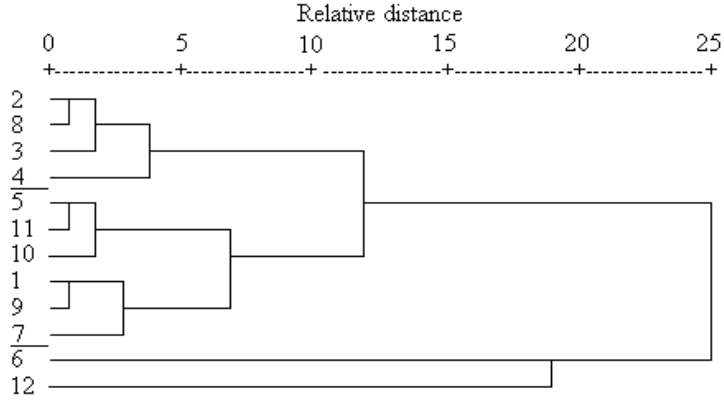

Fig. 2: Dendogram of diet similarity of stone martens, calculated with hierarchical cluster analysis on the basis of estimated percentage biomass (%B) data

Cluster method: between-groups linkage; interval of measure: Pearson correlation. For numbers of each locations see Fig. 1. Short horizontal lines (—) are separate clusters.

Table 2: Composition of animal foods of stone martens living in villages and farms in Hungary

Food taxa[1]	Village												Farm																	
	1		2		3		4		5		6		7		8		9		10		11		12							
	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B	N	%B
House mouse	6	9.7	16	9.0	3	2.8	4	4.6	3	6.9	2	0.6	5	11.5	12	7.0	2	4.0	14	9.9	11	19.0	1	12.7						
Brown rat	4	10.9	5	1.6	2	5.2	1	2.0	3	3.1	5	4.4	13	17.4	8	3.7	2	3.2	7	7.0	8	22.9	2	6.9						
Field mouse	9	11.1	13	7.2	7	6.5	11	10.1	8	35.2	10	5.8	10	11.5	16	10.7	12	23.0	21	25.3	5	2.9								
Common vole			8	9.5	7	11.1	3	0.8			3	2.8	3	2.7	18	10.0	2	1.8	9	8.0	7	9.8	5	8.5						
Other rodents	1	0.5	5	1.5	3	4.8	4	2.9	2	0.3	2	0.1	5	3.4	6	0.4	3	1.3	2	1.4	3	1.5	4	11.1						
Insectivores[2]	3	3.5	4	0.9	4	4.2	2	1.1							1	+	2	1.9			3	0.8								
Other mammals[3]			1	0.4							1	0.3					1	0.1												
Poultry	4	15.9	5	6.9	4	6.9	4	4.0	4	6.3	11	35.6	9	13.5	21	16.4	4	20.5	8	14.1	2	4.4	4	42.3						
Poultry egg	22	10.6	26	9.9	15	4.0	13	5.5	6	4.8	23	7.5	14	11.5	41	2.3	6	6.5	17	2.4	5	2.5	7	5.6						
Other house-food	1	2.4	1	0.6					1	0.5	3	4.1							2	0.4										
Singing birds[4]	31	30.5	77	47.6	37	47.2	37	67.1	12	32.1	45	37.8	26	26.0	99	48.2	23	34.7	32	29.9	25	33.8	7	9.3						
Eggs			1	+			1	0.1	1	0.2	2	0.1					1	0.1	2	0.1										
Reptiles	2	0.3			3	0.5	1	0.1	1	7.7							1	0.4												
Frogs			1	+											1	0.1														
Fish													1	0.1					2	0.8			2	0.6						
Chafer			25	2.6	33	5.1	1	0.2	1	0.6	8	0.6			2	+					1	0.1	1	0.5						
Mole-cricket	4	0.1	15	0.3	1	+	8	0.5			1	+	2	0.0	15	0.1			1	+	4	0.1								
Hymenoptera	34	3.4	25	0.9	19	1.1	7	0.3	2	0.1	11	0.1	11	0.8	21	0.2	2	+	12	0.1	10	0.8	7	0.5						
Other rodents	17	1.0	33	1.0	9	0.6	30	0.7	22	2.4	24	0.2	33	1.6	73	1.0	38	2.4	37	0.5	22	1.4	14	2.1						

[1]for Latin names see Appendix 1, [2]shrews, and a noctule in Csákány (location 3), [3]roe deer in a sample collected in Somogyvári farm (location 9), weasel in Nemesvid (location 2) and in Polány (location 6), [4]Mernyeszentmiklós (in one case an indetermined medium-sized bird was consumed). For other abbreviations see Table 1.

Feeding habits of martens on the basis of prey characteristics

Small sized prey species (ranging between 15 and 50 g) were the most important food of martens on both habitat types (Fig. 3a); it means that consumption of these foods was 60.2% in villages (min.-max. 42.4-80.8%) and 50.4% in farms (28.9-64.2%). Effect of habitat type was not significant when calculating percentage of consumed biomass data (t_{10}= 0.84-1.67, P=0.125-0.550), while prey weight distribution for the martens living in the various environments differed (χ^2_4 =16.50, P<0.01).

The martens typically preyed on terrestrial species (Fig. 3b) both in villages (mean 56.0%, min.-max. 32.9-69.7%), and farm environments (mean 72.4%, min.-max. 64.9-90.2%), however the habitat type dependent difference only on the level of terrestrial prey was significant (t_{10}=2.27, P<0.05). Martens living in villages compared to those living in farms consumed more arboreal prey and less terrestrial prey, but the habitat type dependent difference in this case was not statistically significant (t_{10}=2.09, P=0.063). The overall diet on the basis of prey zonation did not differ significantly (χ^2_2= 3.46, P=0.178).

Martens living in villages and farms consumed primarily habitat generalist prey species (Fig. 3c) which may live both in open habitats and forests or shrubby areas. It means that consumption ratio of these animals was 84.2% in villages (min.-max. 40.0-99.0%) and 87.3% in farms (82.6-92.0%). Nor the habitat dependent difference (on %B data) (t_{10}=0.32-1.24, P=0.243-0.754) neither the distribution of prey depending on habitat association in the diet of martens living in different habitat types was not significant (χ^2_2=4.90, P=0.086).

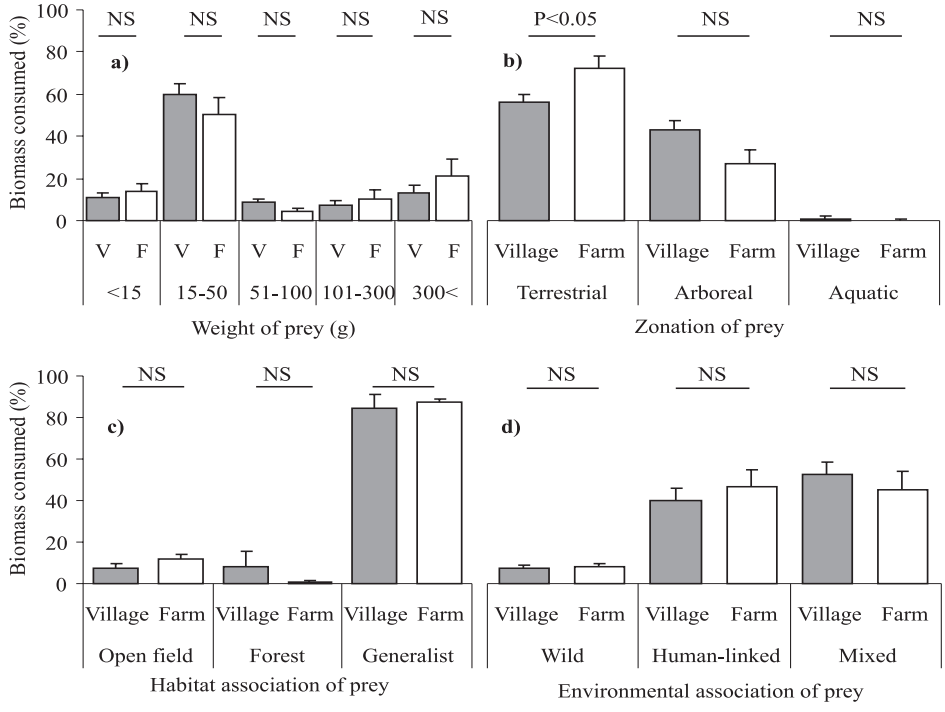

Fig. 3: Distribution of animal food types in the diet on the basis of weight (a), zonation (b), habitat association (c) and environment association (d) of food species.

Martens living in villages and farms consumed in great proportion prey species linked to human environment (39.9%, or 46.8%, respectively), and mixed (living both in wild and human environment) prey species (52.9%, or 45.1), while wild living prey species were eaten in low proportions (Fig. 3d). The consumption ratio of the human-linked prey species in villages the lowest (20.8%) was in Nagyszakácsi, and the highest (65.2%) was in Felsőmocsolád, while on farms ranged between 33.9% (Somogyjád) and 68.7% (Mernye). The habitat type dependent difference was not significant in any case of the groups (t_{10}=0.34-0.80, P=0.442-0.744). The distributions of prey depending on human association in the diet of martens living in the two habitat types was not significant (χ^2_2=4.76, P=0.093).

Consumption of domestic animal, rodent pests and garbage

Martens living in villages and farms also consumed in a quite high ratios of domestic animals (Table 2). In the animal food, the poultry and the poultry egg was found in the largest biomass ratio in Mernye (47.9%) and in Polány (43.1%, from this part of domestic rabbit 0.9%). Pigeon at the farm in Somogyvár (0.2%) and at Felsőmocsolád (5.9%), pig at Nemesvid (0.6%), cat at inner-district of Somogyvár (0.5%) were consumed. In Kisgyalán remains of a parrot (budgerigar), which had been flown away from a house was detected in a scat. Consumption of pet food was found in samples collected in Somogysimonyi (2.4%) and in Polány (3.2%). In a sample collected in Somogyjád, remains of a dog (0.4%) were found. Consumption of domestic animal carrion (and scraps of meal or kitchen offal) - by simultaneous occurrence of carrion and fly pupa - were been significant at such locations (Nemesvid 33%, Nagyszakácsi and Somogyjád 25%, and Kisgyalán 19%).

In animal food, consumption ratio of house mouse and brown rat according to biomass calculation were over than 10% at many of settlements (Table 2). The consumption of these harmful small mammals was especially high on the Mernyeszentmiklós farm (41.9%) and on Felsőmocsolád (28.9%).

In marten scats numerous, originally indigestible material occured, such as pieces of wood (in 51 cases), pieces of tile/brick scrap (12), nylon and straw (10-10), string and wall pieces (9-9), aluminium foil and paper (8-8), piece of rubber (7), salami husk (6), acrylic string (4), slag (3), power cable, limestone and leaf (2-2), styrofoam, sponge, mineral wool, rag, iron-, ceramics scrap, sheep wool and unknown substance (1-1).

In the case of martens living in villages, the relation the indigestible material and the food elements compared was 4.5: 95.5, while in case of farms 3.8: 96.2. The habitat type dependent difference was not significant (χ^2_1=0.75, P=0.388).

Relationship between stone marten and barn owl

In some cases (e.g. in Nemesvid, Polány and Mernyeszentmiklós) samples were collected from both predators in a large sample size (Fig. 4). But in numerous locations either marten scats (e.g. in Felsőmocsoládi farm, Somogysimonyi, Mernye and Gamás), or owl pellets were only found (e.g. in Mesztegnyő, Buzsák, Ecseny and Felsőmocsoládi church).

Distribution of marten scat and owl pellet numbers significantly different by location (χ^2_{19}=1733.38, P<0.0001).

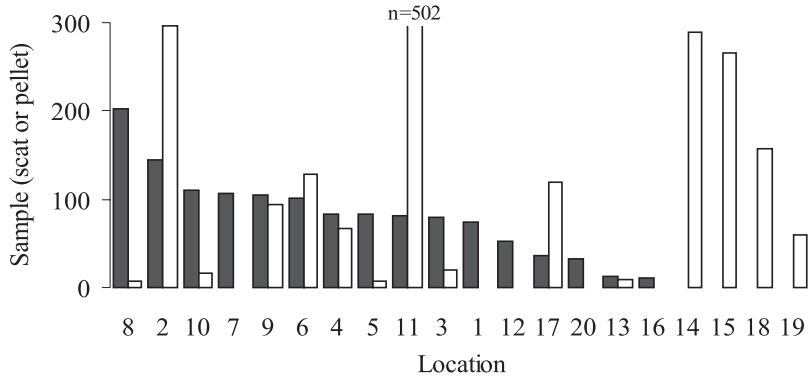

Fig. 4: Distributions of stone marten scat (black bars) and barn owl pellet numbers (open bars) Location order based on the declining number of stone marten samples. For number of locations from 1-12 see Fig. 1; further locations are: 13 – Andormajor, granary, 14 – Mesztegnyő, Catholic church, 15 – Buzsák, Catholic church, 16 – Buzsák, stock-yard, 17 – Öreglak, chapel, 18 – Ecseny, Evangelic church, 19 – Felsőmocsolád, Catholic church and 20 – Gamás.

Discussion

The diet and feeding habits of martens living in the examined villages and farms showed similarity in the summer-autumn period. There was not such a definite habitat dependent difference as it was found in other studies (e.g. in Denmark, urban and rural areas: RASMUSSEN and MADSEN 1985; in Switzerland, urban and rural habitats: TESTER 1986; in France, farmland and marshes: Lodé 1994; in Hungary, village and agricultural environments: LANSZKI 2003). Relying on the overall diet independent of habitat types, cultivated fruits dominated which means unlimited food sources in locations of this study. Fruits are important sources of vitamin and carbohydrate, their consumption is generally high (or primarily) in the summer-autumn period (e.g. HOLISOVÁ and OBRTEL 1982, TESTER 1986, GENOVESI et al. 1996, MARTINOLI and PREATONI 1995, LODÉ 1996, LANSZKI et al. 1999, PRIGIONI et al. 2008). Seeds are defecated without digest by martens and because they have large home ranges (in villages: 10-88 ha, HERRMANN 1994; 66 ha, SEILER et al. 1994; and in farm environments: 350-400 ha, SERAFINI and LOVARI 1993; 185-300 ha, HERRMANN 1994) they have an important role in spreading seeds.

However, in the villages primarily small birds, in farms small mammals were the most important animal foods, but from a taxonomic viewpoint was not a significant habitat-type dependent difference in the diet of the martens. Similarly to the present study, bird consumption was more typical in feeding of those martens which live near settlements (RASMUSSEN and MADSEN 1985, TÓTH 1998, LANSZKI 2003, HELTAI et al. 2005). Although in most of cases a species level identification can not be given, consuming of birds primarily being unbeneficial in viewpoint of nature conservation. It also makes problem that martens often choose such hiding places where bats or barn owls also find shelter (TÓTH et al. 2007). Distribution differences made by marten scat and barn owl pellet

Fig. 5: Granary in Kisgyalán in 2006 (photo: J. Lanszki)

Fig. 6: Egg cacth of marten

Fig. 7: Prey remain of barn rat

Fig. 8: Young stone marten

Fig. 9: Coming out

Fig. 10: Under the roof

numbers do not meant negative direct relationship, but by implication it shows that presence of one of the species is influenced by the presence of the other.

Small mammals dominated in the animal diet of martens living in farms during the summer-autumn period as it was found in other studies (DELIBES 1978, RASMUSSEN and MADSEN 1985, TESTER 1986, GOSZCZYNSKI 1986, SERAFINI and LOVARI 1993, LODÉ 1994, LANSZKI 2003). Especially rodent density of farms could have been considerable, where martens are the natural enemy of house mouse and rat and on the basis of current study important consumer of them. There were significant differences against tendencies beyond in connection with, for instance, near to refuse dumps (rubbish: PRIGIONI et al. 2008, rabbit: LANSZKI and NAGY 2003), during low availability of food sources (birds: LANSZKI and SZÉLES 2007), and Mediterranean areas (invertebrates: GENOVESI et al. 1996).

Martens living in villages have higher food density and more available food, e.g. domestic animals, pigeon, rat, sparrow, vegetable, garden, waste, etc. (HOLISOVÁ and OBRTEL 1982, RASMUSSEN and MADSEN 1985, LUCERINI and CREMA 1993, SIDOROVICH 1997, TÓTH 1998, LANSZKI 2003), furthermore a smaller area is able to ensure enough food (POWELL 1994), fewer competitors are needed furthermore to divide the sources (HOLISOVÁ and OBRTEL 1982, LUCERINI and CREMA 1993).

Marten may cause damages in villages by killing and surplus killing domestic animals (LANSZKINÉ and LANSZKI 2005), while in towns mainly by car damage (e.g. HERR et al. 2009a, 2009b). About one part of consumed domestic animals scavenge were proved (supposedly feeding from rubbish). Consumption of plastic and rubber from indigestible materials are connected with its (especially of cubs) curious and playful temper. These could be the reasons behind their damaging of cables and other plastic equipments of cars too, which were experienced in the examined settlements too in many cases.

Small, mainly terrestrial and habitat-generalist prey species meant the main food of martens in both types of habitat. There weren't such marked habitat type-dependent differences as in a former study (LANSZKI 2003).

To avoid or to reduce marten's damage we have got to recognize those sources which are attractive for martens within human environment (HELTAI et al. 2005). Protection against marten can be built upon prevention, alerting, exclusion and capture (more details: SZEMETHY and HELTAI 2001, HELTAI and SZŐCS 2007). On the basis of the present study ruined buildings, fruits, communal trash, rest of domestic animal cutting, dog or cat food mean important and available sources for martens. Availablity of pet food was limited, but according to the study of LANSZKINÉ and LANSZKI (2005) alerting by dog or any other way is not or just temporarily meant solution for the problem in itself. Elimination of nests is hardly carried out, but getting into preferred buildings, (e.g. in spires) is prevented. The base of an essential methodical management would be only the stantardized model of urban wildlife management (ADAMS et al. 2005).

Acknowledgements

Thanks to J.J. Purger, A. Pintér and Z. Szegvári for their help on field and V. Honfi for the map.

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Appendix 1. Classification of animal foods of stone martens

In brackets the order is weight, zone, habitat type and assiciation to human environment.

Weight: 1 – < 15 g, 2 – 15-50 g, 3 – 51-100 g, 4 – 101-300 g, 5 – >300 g.

Zone: t – terrestrial, a – arboreal, q – aquatic.

Habitat type: o – open, f – forest, bush, g – habitat generalist, - – non-classifiable.

Association to human environment: w – wild-living, h – house-linked, m – mixed.

Vertebrates:

Noctule *Nyctalus noctula* (1, a, g, w), common vole *Microtus arvalis* (2, t, o, w), bank vole *Clethrionomys glareolus* (2, t, f, w), fat dormouse *Glis glis* (4, a, g, m), undetermined dormouse (2, a, f, w), common field mouse *Apodemus sylvaticus* or yellow-necked field mouse *Apodemus flavicollis* (2, t, g, m), striped field mouse *Apodemus agrarius* (2, t, g, m), undetermined field mouse *Apodemus* spp. (2, t, g, m), harvest mouse *Micromys minutus* (1, t, o, w), eastern house mouse *Mus musculus* (1, t, g, h), brown rat *Rattus norvegicus* (4, t, g, h), undetermined rodents (2, t, g, m), undetermined *Crocidura* spp. (1, t, g, m), undetermined shrews (1, t, g, m), common mole *Talpa europaea* (3, t, o, m), weasel *Mustela nivalis* (3, t, o, w), roe deer *Capreolus capreolus* (5, t, g, w), poultry (5, t, -, h), poultry egg (3, t, -, h), pigeon (4, a, -, m), rabbit (5, t, -, h), domestic pig (5, t, -, h), dog (5, t, -, h), domestic cat (5, t, -, h), dog/cat food (-, t, -, h), sparrow *Passer* spp. (2, a, g, h), starling *Sturnus vulgaris* (3, a, g, m), budgerigar *Melopsittacus undulatus* (2, a, -, h), undetermined small passerines (*Passeriformes* spp. (2, a, g, m), medium-sized bird (5, a, g, m), egg (2, t, g, m), lizard *Sauria* spp. (1, t, o, m), colubrine *Colubridae* spp. (3, q, g, w), undetermined *Rana* spp. (2, q, g, w), frog *Anura* spp. (2, q, g, m), pike *Esox lucius* (5, q, o, m), perch *Perca fluviatilis* (2, q, o, m), silver carp *H. molitrix* or *A. nobilis* (5, q, o, m).

Invertebrates:

1, t, o, m: acridoids (*Acridoidea* spp.), mole cricket (*Gryllotalpa gryllotalpa*), honeybee (*Apis mellifera*), beeswax.

1, t, g, m: forest caterpillar hunter (*Calosoma sycophanta*), carabid beetles (*Carabus hortensis, C. scheidleri, C. violaceus, C. coriaceus, C. ullrichi/C. cancellatus*), corn ground beetle (*Zabrus tenebrioides*), other small sized ground beetles (*Pterostichus* and *Harpalus* spp.), undetermined ground beetles and larvae (*Carabidae*), stag beetle (*Lucanus cervus*), lesser stag beetle (*Dorcus parallelepipedus*), undetermined longhorn beetles (*Cerambycidae*), undetermined dor beetles (*Scarabeidae*), rose chafer (*Cetonia* spp.), cockchafer (*Melolontha melolontha*), chafers and larvae (*Melolontha* spp.), snout beetles (*Curculionidae*), ladybird (*Coccinella*), flour-beetle (*Tenebrio molitor*), undetermined beetle and beetle larvae, hornet (*Vespa crabro*), social wasps (*Polistes nimfa, Paravespula germanica*), undetermined wasps, larvae and nest, hymenoptera (*Hymenoptera*), fly (*Brachycera*) pupa, undetermined caterpillar (*Lepidoptera*) and larvae, *Heteroptera* and *Lygaeidae*, undetermined insects (*Insecta*), larvae and pupa.